



DIREÇÃO DE OBRA DE INSTALAÇÕES HIDRÁULICAS E AVAC: ANÁLISE DE PROJETO, PLANEAMENTO, EXECUÇÃO E ACOMPANHAMENTO

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AVAC: ANÁLISE DE PROJETO, PLANEAMENTO,
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ESTÁGIO NA EMPRESA: CASAIS GIBRALTAR

Nuno Miguel Lourenço Ferreira dos Santos
1000035

2019/2020

Instituto Superior de Engenharia do Porto
Departamento de Engenharia Mecânica

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Dissertação apresentada ao Instituto Superior de Engenharia do Porto para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Engenharia Mecânica, realizada sob a orientação de Rui Filipe Neves Araújo Rego.

2019/2020

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*“Afinal, há é que ter paciência, dar tempo ao tempo.
Já devíamos ter aprendido, e de uma vez para sempre,
que o destino tem de fazer muitos rodeios para chegar a qualquer parte”*

José Saramago

Foi um ano difícil. Se foi.

As adversidades enfrentadas foram duras, e por vezes, mais longas que o esperado. O crescimento como pessoa e profissional foi o fruto mais poderoso que colhi durante esta caminhada.

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A todos, o meu agradecimento.

PALAVRAS CHAVE

Direção de Obra, AVAC - Aquecimento, Ventilação e Ar Condicionado, *Fan Coil*, UTA - Unidade de Tratamento de Ar (UTAN), *Close Control*, Plano de Manutenção, *Health Technical Memorandum - British Standards*.

RESUMO

O setor da construção destaca-se por fazer parte do leque de indústrias com maior peso no produto interno bruto (PIB) nos países da União Europeia (UE). A competição existente neste mercado, é grande, e há empresas que se destacam pela forma como atuam no mercado nacional e internacional.

O Grupo Casais destaca-se por ser uma empresa focada no desenvolvimento sustentável, com forte aposta nas energias renováveis, na eficiência energética e num tipo construção sustentável. Empresas com este cariz, mantêm a preocupação em ter quadros técnicos que as possibilitem chegar sempre mais longe.

A gestão eficaz de uma obra de construção acarreta uma série de responsabilidades consideradas como a “chave” para o sucesso. Dela fazem parte o acompanhamento de indicadores de desempenho como tempo, custos, qualidade, segurança e desperdício resultando em altos níveis de produtividade.

A necessidade de execução de trabalhos de ampliação/remodelação de três espaços de um edifício em Gibraltar, território pertencente ao Reino Unido (UK), possibilitou o desenvolvimento de tarefas de coordenação e direção de obra de especialidades como a mecânica, a eletricidade, a carpintaria e a segurança. O presente projeto refletiu a atuação nas áreas de AVAC e Hidráulica e teve como principal objetivo a Análise de Projeto, o Planeamento de obra, Execução e a criação de um Manual de manutenção e operação.

O objetivo final de evidenciar o desempenho positivo nestas fases, foi concretizado. As três fases de obra envolveram as várias equipas, o trabalho foi executado em conformidade com os requisitos legais do próprio país, as equipas das várias

especialidades trabalharam em concordância e respeito e o orçamento inicialmente previsto foi cumprido.

À parte de eventuais contratempos, as obras foram entregues nos prazos estipulados e com os atributos exigidos.

KEYWORDS

Site Management, HVAC – Heating, Ventilation and Air Conditioning, Fan Coil, Air Handling Unit (AHU), Close Control, Maintenance plan, Health Technical Memorandum - British Standards.

ABSTRACT

The construction sector stands out for being part of the most relevant industries that contributes for the gross domestic product (GDP) in the European Union (EU) countries. The existing competition in this field is large and there are companies that stand out for the way they operate in national and international markets.

Casais Group stands out for being a company focused on sustainable development with a strong wage on renewable energies, energy efficiency and on sustainable construction. These types of Companies have kept their interest on having qualified professionals that which enable them to always reach further.

The construction work's effective management carries a serious amount of responsibilities considered as the "key" for success. Among them, there is the monitoring performance process indicators such as time, costs, quality, safety and waste. The use of these indicators could result in a higher level of productivity.

The need to execute an expansion and remodelling works of three building spaces at Gibraltar, United Kingdom (UK) region, enabled the development of coordination specialties tasks as mechanic, electricity, carpentry, and safety. This project reflected the performance on HVAC and Hydraulic areas and the main goal was the project analysis, construction planning, execution, and the creation of a Maintenance-Operation manual.

The final goal of a positive development in the three stages of works has been achieved. All works has been developed in accordance with UK legal requests. The teams worked in agreement, respect and the initial budget plan has been met.

Apart from any potential setbacks the construction works were handed out on the expected timelines and with the required attributes.

LISTA DE SÍMBOLOS E ABREVIATURAS

Lista de Abreviaturas

AHU	<i>Air Handling Unit</i>
ASHRAE	<i>American Society of Heating, Refrigerating and Air-Conditioning Engineers</i>
AVAC	Aquecimento, Ventilação e Ar Condicionado
COVs	Compostos Orgânicos Voláteis
DL	Decreto-Lei
DO	Diretor de Obra
DX	Sistema de Expansão Direta
EO	Encarregado de Obra
UE	União Europeia (<i>European Union</i>)
EUA	Estados Unidos da América
GTE	Gestão Técnica Centralizada
HTM	<i>Health Technical Memorandum</i>
HVAC	<i>Heating, Ventilation and Air Conditioning</i>
ISEP	Instituto Superior de Engenharia do Porto
ISO	<i>International Organization for Standardization</i>
MO	Mão de Obra
OMS	Organização Mundial de Saúde
O&M	<i>Operations and Maintenance</i>
PIB	Produto interno bruto
RECS	Regulamento de Desempenho Energético dos Edifícios de Comércio e Serviços
REH	Regulamento de Desempenho Energético dos Edifícios de Habitação
RIM	Requisição interna de material e Equipamento
SCE	Sistema Certificação Energética dos Edifícios
S. A	Sociedade Anónima
UK	<i>United Kingdom</i>
UTA	Unidade de Tratamento de Ar
UTAN	Unidade de Tratamento de Ar Novo
VAC	Sistema de volume e ar constante
VAV	Sistema de volume e ar variável
VVT	Sistema de volume e temperatura variável
WHO	<i>World Health Organization</i>

Lista de Unidades

AC/h	<i>Air Changes/hora</i>
mm	Milímetros
bar	Bar (unidade de pressão)
h	hora
°C	Graus Celcius

Lista de Símbolos

®	Marca Registada
%	Por cento

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INTRODUÇÃO

1 INTRODUÇÃO

1.1 CONTEXTUALIZAÇÃO

A indústria da construção, destaca-se mundialmente por ser um dos setores com maior significado para o crescimento da economia de cada país (Azman et al., 2018). De acordo com a informação obtida da Federação da Indústria Europeia da Construção, este setor é responsável por 9,7% do produto interno bruto (PIB) nos países da União Europeia (EU), tendo atingindo um valor total de construção próximo dos 1,186 biliões no ano de 2010 e capaz de ser responsável por cerca de 6,6% do emprego (Naoum, 2016). Estes factos sugerem que a aposta no desenvolvimento e investigação no setor da construção pode revelar-se uma grande mais valia para a sociedade.

A forma como é realizada a gestão de um projeto, determina o resultado do mesmo. Um gestão eficaz é considerada como a chave para altos níveis de desempenho num projeto de construção considerando o acompanhamento de indicadores como: tempo, custos, qualidade, segurança e desperdício (Ajayi et al., 2017). A tarefa de coordenar os meios humanos e materiais deve permanecer atual e deve envolver as técnicas mais modernas de gestão para que os indicadores descritos devolvam resultados satisfatórios. Com eventuais alterações aos projetos, o nível de produtividade de um projeto pode sofrer um impacto negativos e por esse motivo o responsável de obra deve adotar uma gestão focada na prevenção detetando antecipadamente possíveis desvios (Kozlovskaja et al., 2016).

O trabalho apresentado surge no seguimento da necessidade de construção de duas unidades de saúde (*New Children's Health Centre – CPC* e *New Primary Care Centre – PCC*) e da ampliação dos serviços financeiros de Gibraltar (*New Gibraltar Financial Services Centre - FSC*). O trabalho foi diariamente desenvolvido e partilhado, maioritariamente, pelas especialidades de construção civil, mecânica e eletricidade. A instalação de sistemas AVAC – Aquecimento, Ventilação e Ar Condicionado, é considerada como uma das especialidades da engenharia mecânica. Pretende aliar o

conforto térmico a fatores como custos de instalação, manutenção e eficiência energética. O conforto surge como a palavra chave e a origem para a implementação de um sistema de climatização, o que significa encontrar o equilíbrio entre fatores térmicos, de qualidade de ar interior e acústica proporcionando um ambiente de qualidade como resultado de valor acrescentado (Dalla Mora et al., 2018).

Num ambiente hospitalar, onde a maior parte deste trabalho foi desenvolvido, o processo de controlo e monitorização associado aos valores de humidade, temperatura e a qualidade de ar interior requer ainda maior atenção. O estudo do sistema a implementar deve ser rigoroso e deve cumprir todos os requisitos exigidos pela unidade hospitalar uma vez que estes dependem do tipo de edifício e acima de tudo do tipo de serviços prestados em cada ala hospitalar (Saran et al., 2020).

1.2 OBJETIVOS

O projeto desenvolvido surgiu da oportunidade da realização de um estágio, com duração de doze meses, na empresa Casais Gibraltar, com o propósito de desenvolver tarefas relacionadas com a Direção de Obra nas especialidades AVAC e Hidráulica. O estágio resultou de um acordo entre o Instituto Superior de Engenharia do Porto (ISEP), a empresa e o aluno, tem como principal objetivo transportar os conhecimentos adquiridos ao longo do percurso académico para um ambiente prático.

A natureza do projeto, destaca a necessidade do desenvolvimento de tarefas relacionadas com os departamentos de orçamentação e produção sendo este último o responsável pela maior parte da atividade de direção de obra.

Este documento pretende refletir o conjunto de trabalhos desenvolvidos ao longo destes doze meses, salientando a Análise de Projeto, o Planeamento de obra, a Execução e por fim, não menos importante, a elaboração do plano de manutenção detalhado e simplificado.

1.3 ESTRUTURA DA DISSERTAÇÃO

Este trabalho é constituído por um primeiro capítulo que reúne informações como a contextualização do tema, fazendo uma abordagem ao setor e respetivos desafios, a apresentação dos objetivos do trabalho, a metodologia e estrutura adotadas e, importante num trabalho desta natureza, a descrição da empresa onde foi realizado o estágio.

O segundo capítulo reflete a revisão da literatura existente sobre a temática em questão, designadamente o conceito de direção de obra, os sistemas AVAC e a importância da criação de um plano de manutenção. Neste capítulo, os recursos de pesquisa favorecidos foram livros técnicos e artigos científicos.

No capítulo 3 é exposta toda a estratégia do trabalho desenvolvido, descrevendo as tarefas por ordem cronológica dos acontecimentos. Aqui, aprofundam-se as fases que compõem a direção de obra: Análise de Projeto, Planeamento, Execução e Acompanhamento e por fim o Plano de Manutenção. É neste capítulo que se registam os métodos de trabalho adotados, os documentos associados à atividade de direção de obra e onde se expõe os conhecimentos técnicos. Durante esta fase do trabalho são discutidas as opções selecionadas, a constituição técnica dos materiais/equipamentos e ainda é feita uma reflexão sobre os principais obstáculos encontrados.

O capítulo das Conclusões reflete o resumo do trabalho desenvolvido e os ganhos que as atividades proporcionaram perante o objetivo inicial.

1.4 EMPRESA DE ACOLHIMENTO

1.4.1 GRUPO CASAIS

*“Transportai um punhado de terra todos os dias
e fareis uma montanha”*

in Mestria, 60 Anos do Grupo Casais

A Empresa CASAIS, fundada a 23 de maio de 1958 com a designação de “António Fernandes da Silva & Irmãos, Lda.”, é atualmente uma das maiores empresas do setor da construção em Portugal, mantendo ao longo destes anos o seu cariz familiar (Grupo Casais, 2018).

No ano de 1991, adotou o nome da família transformando-se em Empreiteiros Casais de António Fernandes da Silva, SA cujo administrador é, até hoje e desde há 60 anos, o Mestre António Casais.

Mantendo uma estratégia orientada para o Futuro, Inovação e Sustentabilidade, o Grupo CASAIS manifesta ser uma organização de referência no setor da construção e com forte presença internacional (Grupo Casais, 2017). A constante visão empreendedora permitiu alcançar mais de cinco décadas de atividade diversificada concebendo estabilização e ultrapassando os obstáculos que inevitavelmente foram ocorrendo, atingindo metas e objetivos bem definidos. Caracteriza-se por ser uma organização orientada para projetos de grande envergadura, com elevada complexidade tanto técnica como de execução, apostando em equipas multidisciplinares, responsáveis e competentes.

Ao longo da sua história, as várias empresas que integram o Grupo CASAIS foram, por diversas vezes, distinguidas ou viram as suas obras ganhar prémios que atestam a sua inovação e qualidade. Nos últimos anos, são ainda mais frequentes os galardões bem como mais diversificados.

1.4.2 EVOLUÇÃO E PRESENÇA NO MUNDO

Em 1994, a Empresa deu início ao seu processo de internacionalização sendo a Alemanha o país escolhido como primeiro palco e um pilar da estratégia de crescimento orgânico, sustentado em alianças e parcerias locais. A Alemanha foi seguida de países como: Angola (1999), Bélgica (2001), Marrocos (2004) e Gibraltar (2005). Decorridos 14 anos, e já no ano de 2008, alterou a designação comercial para “Casais – Engenharia e Construção S.A”, sinalizando cinco décadas de atividade.

O processo de internacionalização seguiu caminho com a entrada no mercado holandês em 2010, Brasil e Cabo Verde em 2011, Qatar, Argélia e França em 2012 e mais recentemente somando três posições estratégicas no Reino Unido, Espanha, Emirados Árabes e Estados Unidos da América.

Atualmente, o Grupo CASAIS marca presença consolidada num total de 16 países (Figura 1), continuando a valorizar e fomentar o crescimento nacional assim como a aposta em áreas de negócio mais jovens como o Ambiente, a Energia e os Serviços (Grupo Casais, 2017).

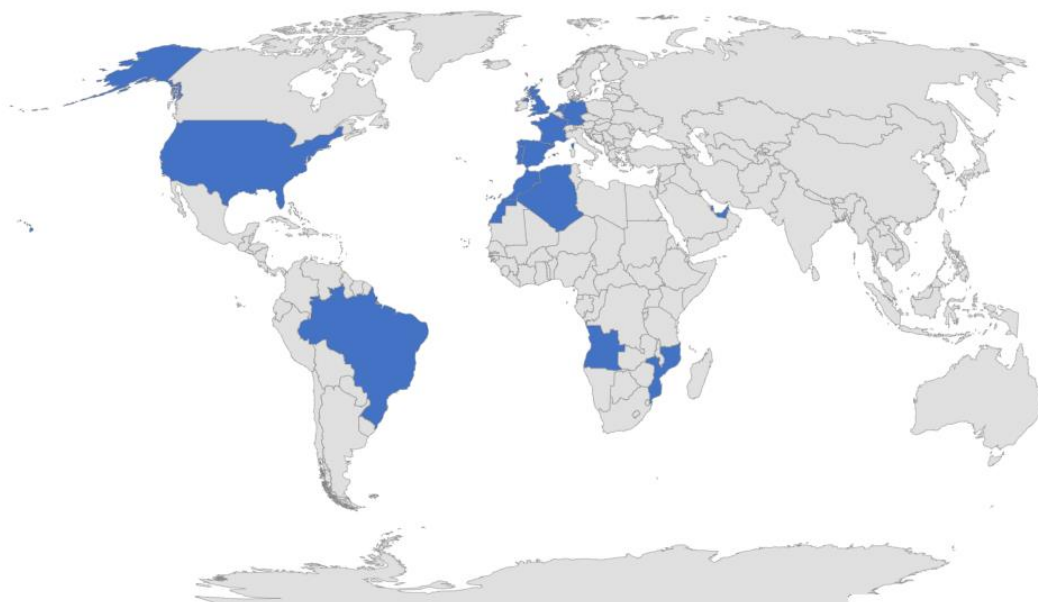


Figura 1 - Presença no Mundo: Países onde o Grupo Casais marca presença nas diversas áreas de atividade.

1.4.3 SUSTENTABILIDADE E INOVAÇÃO

O Grupo CASAIS possui atualmente uma política de implementação de novos projetos visando o desenvolvimento sustentável, mantendo uma forte aposta nas energias renováveis, na eficiência energética e na construção sustentável. Desta forma, mantêm-se na “linha da frente” da inovação e da criação de valores nos negócios, na procura da excelência nas soluções e no serviço dos clientes, atingindo elevados níveis de satisfação e confiança (Grupo Casais, 2017).

A mudança que se verifica atualmente cada vez mais de forma acelerada, obriga à adaptação com agilidade às alterações do meio da construção exigindo um capital humano preparado e capaz de atuar num meio considerado “turbulento” e de constante mudança. Desta forma, a organização promove constantemente a flexibilidade de Recursos Humanos de modo a ser capaz de responder aos projetos complexos que diariamente surgem, fato este que destaca o Grupo CASAIS da concorrência, consolidando uma cultura de empresa forte.

1.4.4 MISSÃO, VISÃO E VALORES

A visão do Grupo empresa é ser uma referência de conhecimento e solidez na área da Engenharia e da Construção. A missão destaca-se pela capacidade de gerir com mestria e inovação, privilegiando sempre parcerias estratégicas e novos mercados alicerçados numa cultura de excelência e sustentabilidade.

Os valores Grupo CASAIS estão presentes no dia a dia de todas as equipas nos vários territórios de atuação: Conhecimento, Cooperação, Dedicção, Determinação, Flexibilidade, Humanismo, Integridade e Rigor (*Casais, Institucional*).

REVISÃO DA LITERATURA

2 REVISÃO DA LITERATURA

2.1 O CONCEITO DE DIREÇÃO DE OBRA

O conceito de Direção de Obra engloba uma série de temas fundamentais à execução de um determinado trabalho na construção. O papel do Diretor de Obra (DO) reúne um conjunto de atividades discriminadas pela sua complexidade e pela necessidade de recursos, pessoas e serviços. Para a realização de uma empreitada nas condições ideais é necessário que o DO forneça o acompanhamento em obra adequado às necessidades que, todos os dias, vão surgindo. Esta gestão é fundamental para que, no final, se cumpram objetivos, prazos e como resultado se obtenham os níveis de desempenho esperados dos projetos de construção (Ajayi et al., 2017), (Kozlovska et al., 2016). Destacam-se, as principais funções de um DO:

- Gestão de obra nos aspetos administrativos, técnicos e económicos tais como: mão de obra, materiais, equipamentos, subempreitadas;
- Responsabilidade pelo cumprimento das cláusulas constantes nos contratos, caderno de encargos¹ e restantes documentos que possam constituir o processo de obra tais como normas em vigor nas condições impostas;
- Responsabilidade pela realização de ensaios previstos no caderno de encargos;
- Estudo dos processos de construção mais adequados para a realização dos trabalhos;
- Gestão da execução da obra em aspetos relacionados com a segurança de todos os trabalhadores envolvidos.

¹ Caderno de Encargos, definição no capítulo 3 deste trabalho - “Análise de projeto”

Um DO deve saber, e manter viva, a ideia de que dirigir é saber traçar o caminho entre os objetivos estabelecidos inicialmente e o resultado pretendido, criando condições para fornecer os *inputs* necessários no momento certo. Esta forma de atuar, permite alcançar altos níveis de produtividade na construção quando interligada a fatores como a qualidade de construção, a segurança, os prazos, os custos e não esquecendo as questões ambientais (Azman et al., 2018). Geralmente a produtividade é definida como o máximo daquilo que se consegue atingir (*output*) ao conseguir *otimizar* todos os *inputs* (Ghate, 2016), (Naoum, 2016). Alguns estudos sugerem que se possa calcular a produtividade, na área da construção, através da equação,

$$Produtividade = \frac{Output}{M\tilde{a}o\ de\ Obra + Equipamentos + Materiais} \quad (\text{Equação 2-1})$$

No seguimento da procura de altos níveis de produtividade, e acrescentando ao já referido anteriormente, é importante ainda salientar que um DO deve avaliar as opiniões do diferentes *stakeholders* e ajustar os procedimentos necessários a uma decisão final que apresente um menor nível de desperdício. Além disto um DO deverá ser capaz de identificar os melhores procedimentos e práticas garantindo a continuidade das mesmas durante toda a execução da obra (Ajayi et al., 2017). Os equipamentos e materiais fazem parte de um dos maiores problemas na gestão de uma obra de construção. Os materiais utilizados são capazes de corresponder a cerca de 70% do custo de uma obra pelo que devem ser geridos de forma equilibrada adequando os pedidos de acordo com as necessidades para evitar desperdícios (Kulkarni et al., 2017), (Donyavi & Flanagan, 2009). Cabe ao DO avaliar a necessidade de material, escolha dos equipamentos que mais se adequam ao projeto e a apresentação dos mesmos ao respetivo dono de obra.

Na área da construção, são diversas as especialidades envolvidas durante a execução de um determinado trabalho. Uma obra não é concluída com a intervenção apenas da especialidade da Engenharia Civil, uma vez que existem conceitos específicos de outras áreas que devem ser tidos em conta e entregues a especialistas, pela origem da sua complexidade. Como especialidades adicionais a um projeto de construção, podem destacar-se a mecânica, a carpintaria, a eletricidade e a segurança. Para cada uma

destas, e dependendo da dimensão da obra, deverá existir idealmente um DO ou, pelo menos, um responsável de departamento capaz de tomar todas as decisões e fornecer as condições necessárias de trabalho às equipas de cada especialidade. Durante a fase de construção, o DO é responsável pela orientação das equipas durante a execução dos trabalhos devendo para isso ter a capacidade de as motivar e zelar pela sua segurança. De uma forma generalizada, o organograma representado na Figura 2, ilustra forma como se organizam as várias funções durante a execução de um trabalho.

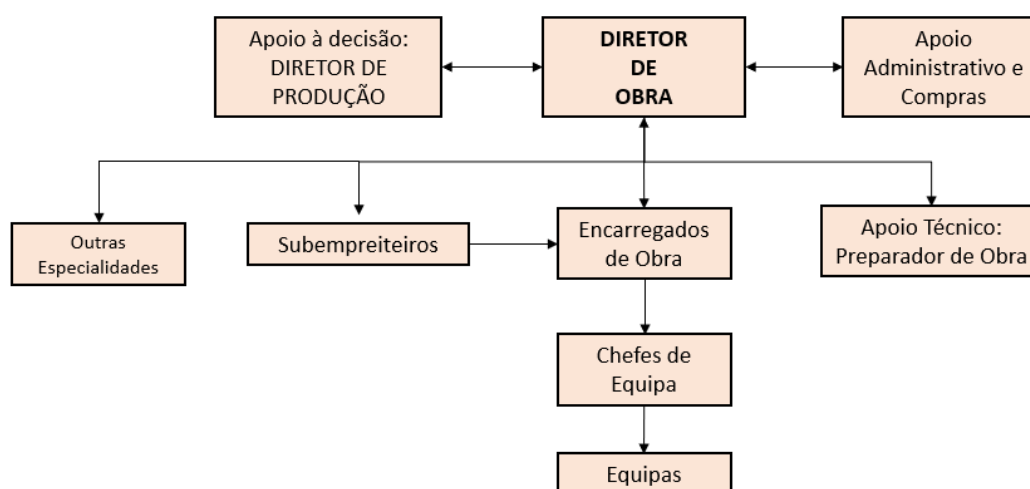


Figura 2 – Organograma de hierarquias de obra

Na fase de preparação inicial da obra, as funções de direção de obra devem focar-se maioritariamente em reduzir o desperdício gerado durante a fase de projeto, procurando alternativas e soluções para eventuais erros (Ajayi et al., 2017). Os principais aspetos a ter em conta e que se demonstram cruciais ao bom desempenho dos trabalhos a executar podem resumir-se a:

- Revisão do orçamento;
- Análise e/ou revisão do projeto;
- Mapa de Produção – Orçamento para a produção;
- Análise de Erros e Omissões²;

² Erros e Omissões, definição no capítulo 3 deste trabalho - “Análise de projeto”

- Definição da estrutura produtiva: Subempreitadas e empresas do Grupo;
- Planeamento da obra e equipamentos necessários;
- Organização física do estaleiro da obra;
- Organização geral administrativa da obra (Diretores adjuntos, técnicos, preparadores).
- Definir Equipas de trabalho (Encarregados, frentes de obra e chefes de equipa);

Durante a execução dos trabalhos, salientam-se algumas tarefas consideradas como sendo fundamentais:

- Revisão do orçamento inicial;
- Reformulação do plano de trabalhos;
- Assegurar a correta gestão dos recursos produtivos de MO, Material, Equipamentos, Subempreitadas);
- Coordenação geral das equipas em obra;
- Gerir alterações ao projeto, de fornecedores e de subempreitadas;
- Controlar, assiduamente, os prazos e custos de obra;
- Avaliar o desempenho das equipas.

2.2 AVAC – AQUECIMENTO, VENTILAÇÃO E AR CONDICIONADO

2.2.1 O conceito de AVAC

O termo AVAC, ou em inglês HVAC - *Heating, Ventilation and Air Conditioning*, está implicitamente associado ao conceito de conforto (De Carlo & Arleo, 2013). Para o ser humano, o conforto térmico é definido como a sensação e satisfação perante o ambiente térmico onde se está inserido (Zare et al., 2018). A ISO 7730 (2005) é a norma que serve como guia para estimar a sensação de conforto de um indivíduo quando este é sujeito a um determinado ambiente térmico.

O aquecimento, a ventilação e o ar condicionado formam o conjunto de processos responsáveis pela aplicação apropriada de um sistema AVAC e são a chave para melhorar a eficiência energética de um edifício (Afroz et al., 2018).

O AVAC é atualmente responsável pela maior parte do consumo energético em edifícios sendo por isso uma área distinguida pela importância que a sua análise requer ao ser implementado um sistema deste tipo numa construção (Vakiloroaya et al., 2013), (Tong, 2017). São vários os estudos que permitem avaliar o impacto do consumo desta energia assim como formas de tornar o sistema AVAC cada vez mais sustentável.

A elaboração de um projeto AVAC, tem como objetivo dimensionar e ajustar os equipamentos e materiais relacionados com a climatização de um espaço numa obra. O estudo de um projeto deste tipo deve ser tarefa realizada com responsabilidade por se tratar de um tema minucioso e com algumas restrições regulamentares das quais dependem o bem-estar, a segurança e a saúde do utilizador final.

São diversos os tipos de equipamentos que podem ser selecionados para um projeto AVAC e, por isso, é importante adotar soluções viáveis no que respeita a consumos energéticos e aos custos de produção do sistema.

2.2.2 Sistemas de Climatização

A definição de sistema de climatização pode ser designado por conjunto de equipamentos coerentemente combinados com vista a satisfazer objetivos da climatização, designadamente, ventilação, aquecimento, arrefecimento, humedificação, desumidificação e filtragem do ar (Diário da República, 2013).

De uma forma geral, um sistema de climatização pode ser caracterizado em função da área de climatizada ou em função do fluido térmico. Resumidamente, e de acordo com a bibliografia (Roriz, 2006), pode considerar-se o seguinte esquema (Figura 3):

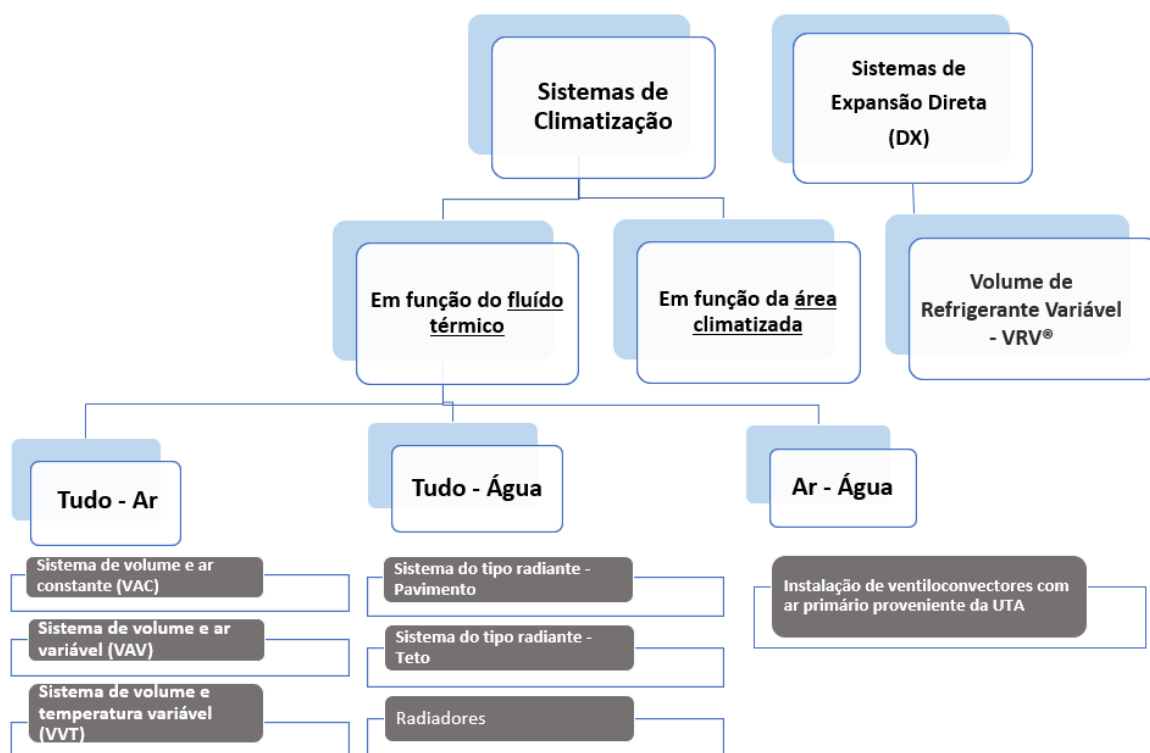


Figura 3 – Esquema-resumo de tipos de Sistemas de Climatização.

Os sistemas de climatização **em função da área climatizada** resumem-se a dois grupos: centralizados e individuais. Como as próprias designações indicam, estes diferem na sua capacidade de abrangência de espaço. Um sistema centralizado serve praticamente toda a área de um edifício. Por sua vez, num sistema individual, os equipamentos servem apenas uma área restrita do edifício e são habitualmente denominados de “*splits*”. Este é um sistema caracterizado por possuir equipamentos de climatização compactos, repartidos e autónomos, de pequena capacidade, servindo apenas uma sala ou uma parte de um edifício.

Quando se classificam os sistemas **em função do fluido térmico**, a complexidade aumenta uma vez que estes podem ser do tipo Tudo-Ar, Tudo-Água ou Ar-Água, como a figura 3 explana. Nesta fase importa perceber o conceito de cada uma das opções descritas, mas na forma de breve descrição.

- **Tudo-Ar**

Segundo a descrição de Roriz (2006), o frio ou calor é transportado para o local a climatizar através de ar proveniente de uma Unidade de Tratamento de Ar (UTA) e podem ser de três tipos: Sistema de volume e ar constante (VAC), Sistema de volume e ar variável (VAV) e ainda Sistema de volume e temperatura variável (VVT). Estes modos de funcionamento têm em comum o facto de climatizarem o espaço através da mistura do ar lançado e o ar existente na sala (espaço).

- **Tudo-Água**

No sistema Tudo-Água a distribuição de água quente, ou fria, é feita em função das necessidades de aquecimento e arrefecimento, respetivamente. Estes sistemas apresentam a vantagem de necessitarem dum espaço reduzido para o circuito de tubagem de distribuição de água aos diferentes locais.

Os sistemas Tudo-Água podem distinguir-se por serem do tipo convecção e radiante. Os sistemas tipo convecção são compostos por radiadores que podem ser instalados numa parede próxima ao chão, ou podem diretamente no chão, cobertos por uma grade metálica.

Os sistemas do tipo radiante podem ser de pavimento ou de teto, sendo que a escolha depende do fim. Ou seja, preferencialmente, por razões técnicas e de conforto, para um processo de aquecimento utiliza-se o tipo “chão radiante” e para o arrefecimento o “teto radiante”.

- **Ar-Água**

Neste caso, o condicionamento dos ambientes dos diferentes locais é feito utilizando em simultâneo a distribuição de água e de ar, atuando ambos como fluido térmico. O ar introduzido nos locais é designado de ar primário e é constituído normalmente apenas por ar novo, tratado centralmente numa unidade de tratamento de ar, a chamada UTAN. Este ar, assegura as necessidades mínimas de ventilação e o controlo da humidade relativa nos diferentes locais.

No trabalho apresentado o sistema de climatização base utiliza ventiloconvectores para corrigir a temperatura interior nos gabinetes, sendo o ar primário proveniente de uma UTAN.

Adicionalmente aos sistemas mencionados anteriormente, existem ainda os sistemas de expansão direta. Um exemplo deste tipo, são os sistemas VRV® – Volume de Refrigerante Variável ou, em inglês, *Variable Refrigerant Flow* (VRF). Um sistema VRV® tem a particularidade de climatizar várias zonas distintas, ou seja, pode servir um conjunto de zonas de um edifício e é facilmente possível de ser ampliado. Neste modelo, uma unidade exterior é capaz de estar ligada a várias unidades interiores (Figura 4).

Os desenvolvimentos eletrónicos previstos para este tipo de equipamentos têm contribuído, em muito, para diminuir os consumos energéticos e por assim aumentar a sua eficiência energética face a outro tipo de sistemas.

Ainda nos sistemas de expansão direta, este também pode ser aplicado apenas com a utilização de uma unidade individual. Isto acontece quando, normalmente, se climatiza um espaço dentro de um edifício. Assim, utiliza-se uma unidade exterior que troca energia com uma unidade interior. A estes sistemas, chamamos “split”.



Figura 4 – Sistema de Climatização do tipo VRV® (Installation example of VRV system) (Daikin, 2004)

2.2.3 Equipamentos

O resumo constituído no ponto anterior permite perceber, que perante a extensão de possibilidades existentes nos sistemas de climatização, os equipamentos disponíveis que o mercado desta área tem para oferecer, estarão em concordância. Para cada um dos sistemas seria possível descrever um equipamento diferente, ou mesmo vários. No entanto, e perante a natureza deste trabalho, deverá ser feita uma abordagem de cariz teórico apenas dos equipamentos que foram utilizados no decorrer do projeto. Assim, destacam-se as UTAN, Fan Coil, e o sistema de expansão direta (DX) constituído por Close Control e Mono-Split (Cassete 4 vias).

2.2.3.1 Unidade de Tratamento de Ar (UTA)

A unidade de tratamento de ar (UTA) é um dos componentes mais importantes nos sistemas AVAC. A principal função desta unidade é controlar a qualidade de ar interior através do fornecimento de ar externo (Leong, 2019). De acordo com a definição da *Eurovent Certification* a UTA tem na sua constituição, um módulo de ventilação, um módulo de filtragem, bateria de aquecimento e arrefecimento e um tabuleiro de condensados (Figura 5).

Com a utilização de uma UTA podemos ter as seguintes funções:

- Filtragem;
- Aumento e diminuição de temperatura do ar;
- Aumento ou diminuição do teor de água no ar;
- Controlo de caudais de ar (extraído, insuflado, ar novo);
- Ação sobre a pressão dos espaços;
- Integração de técnicas eficientes de ventilação:
 - Arrefecimento ou aquecimento gratuito;
 - Recuperação energética.

Uma UTA pode ter a capacidade de tratar ar proveniente 100% do exterior e nesse caso deve ser designada de Unidade de Tratamento de Ar Novo (UTAN). O Ar novo significa que é proveniente do exterior e é introduzido no sistema de climatização para renovação do ar do local para parâmetros adequados em termos de qualidade de ar, higiene e saúde.

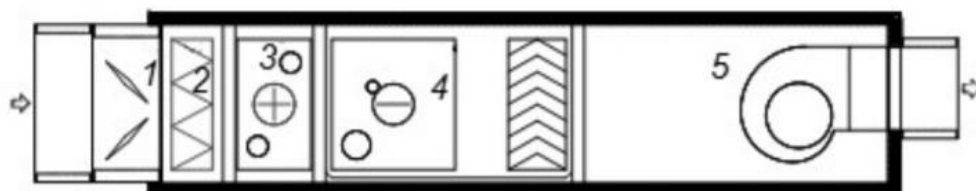


Figura 5 - Configuração geral de uma UTA. 1 – PAINEL frontal; 2 – Filtro; 3 – Bateria ar quente (+); 4 – Bateria ar frio (-) ; 5 – Módulo de ventilação (Osintsev et al., 2018).

2.2.3.2 Unidade Fan Coil

O *design* geral de uma unidade Fan Coil proporciona alguma flexibilidade na sua utilização por existir em várias configurações (chão/verticais, teto falso/horizontais, cassetes 4 vias) e é facilmente selecionada como opção de climatização uma vez que possui um consumo energético bastante satisfatório (Sekhar et al., 2011).

Uma constituição típica de um fan coil pode ser:

- Filtro plano (EU2 ou EU3);
- Bateria(s);
- Ventilador;
- Tabuleiro de recolha de condensados;
- Válvula de seccionamento e regulação;
- Termostato (3 velocidades).

Os Fan Coil's proporcionam tanto o arrefecimento como o aquecimento e movimentam o ar por convenção forçada (ventilador). Os elementos que compõem uma unidade deste tipo estão representados na Figura 6.

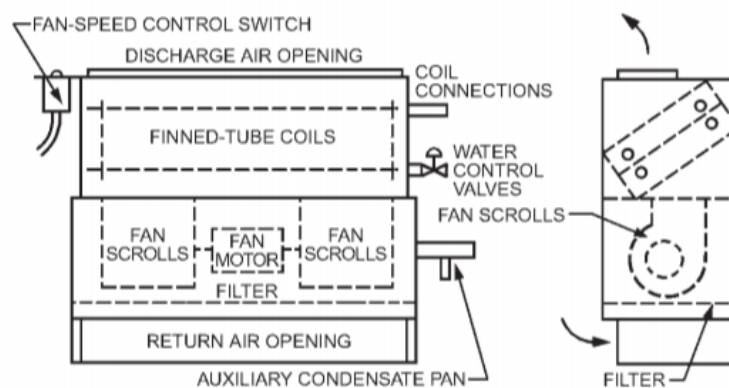


Figura 6 - Esquema-tipo de uma unidade Fan Coil (ASHRAE, 2012)

2.2.3.3 Close Control

A unidade Close Control está dentro do grupo de equipamentos do sistema DX. Estas unidades para além do controlo de temperatura, possuem uma tecnologia que permite também fazer o controlo da humidade e qualidade do ar de um espaço, garantindo um funcionamento eficiente, 24 horas/dia, nos sete dias da semana. Este equipamento é utilizado em espaços específicos onde as condições ambiente exigem maior cuidado como são o caso de Salas de Informática, Centrais telefónicas e Instalações Técnicas Especiais. Por este facto, a construção de equipamentos deste tipo é submetida a altos parâmetros de qualidade de engenharia.



Figura 7 - Representação esquemática de uma unidade *Close Control* (Airedale, n.d)

2.2.3.4 Mono-Split

Um sistema mono-*split* é considerado um “*room air conditioner*” e faz parte da categoria de sistemas DX. Possui a função de fornecer calor ou frio no interior de um espaço e têm na sua constituição uma fonte primária de refrigeração e desumidificação e um circuito de filtragem e circulação de ar, podendo também existir um meio para aquecimento (ASHRAE, 2012). De uma forma geral, este equipamento permite obter um ambiente de conforto através do arrefecimento, aquecimento, desumidificação, ventilação e filtragem (Figura 8).

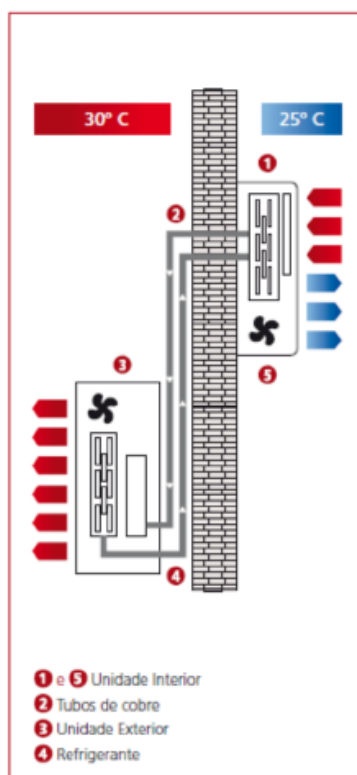


Figura 8 - Esquema-tipo de um sistema Mono-Split (Lumelco Portugal)

2.2.4 Qualidade de Ar Interior

A Qualidade de Ar Interior (QAI) é atualmente considerado como um parâmetro de extrema importância no dia a dia de um ser humano uma vez que cerca de 80% do tempo é passado em ambientes fechados e sujeitos à exposição de níveis elevados de poluentes (Cano et al., 2016). A QAI observada em habitações, escritórios, escolas, hospitais, etc, é um fator essencial e determinante para o conforto e bem-estar dos utilizadores (Fernandes et al., 2017). O controlo da QAI deve ser realizado com a

finalidade de evitar que os poluentes atinjam concentrações capazes de colocar em risco a saúde dos ocupantes e de forma a garantir o conforto dos mesmos.

Este trabalho foi desenvolvido maioritariamente em ambiente hospitalar o que reforça a necessidade de controlo deste parâmetro uma vez que a origem da atividade desenvolvida neste contexto pode ser responsável pelo facto de os níveis de contaminação do ar serem bastante superiores, o que implica uma atenção redobrada na avaliação de riscos e monitorização da QAI. Vários poluentes do ar interior são responsáveis por doenças respiratórias, alergias, intoxicações e deles fazem parte os compostos orgânicos voláteis (COVs) e os poluentes biológicos (Litiu, Andrei *et al* 2007). Atualmente, a Organização Mundial de Saúde (OMS), ou em inglês *World Health Organization* (WHO), considera que a poluição do ar interior é o 8º fator de risco mais importante para a saúde pública e publicou um guia onde descreve os poluentes químicos presentes no ar interior, os respetivos riscos, propriedades tóxicas e os efeitos causados na saúde (WHO/Europe, 2010).

2.2.4.1 Enquadramento Legal

Em Portugal, a legislação que assegura o cumprimento de requisitos na avaliação da QAI, é regulamentada pelo Decreto-Lei 118/2013.

De uma forma geral, este regulamento surge com o objetivo de assegurar e promover a melhoria do desempenho energético dos edifícios através da aplicação da legislação em vigor que integra o Sistema Certificação Energética dos Edifícios (SCE), o Regulamento de Desempenho Energético dos Edifícios de Habitação (REH) e o Regulamento de Desempenho Energético dos Edifícios de Comércio e Serviços (RECS). O Decreto-Lei 118/2013 transpõe para a ordem jurídica nacional a Diretiva n.º2010/31/EU do Parlamento Europeu e do Conselho, de 19 de Maio de 2010, relativa ao desempenho energético dos edifícios.

O Decreto-Lei 118/2013 é responsável pela definição dos requisitos a cumprir e a avaliação do desempenho energético dos edifícios baseia-se nos seguintes pontos:

- No caso de se tratar de edifícios de habitação, é de destacar o comportamento térmico e a eficiência dos sistemas;
- Caso sejam edifícios de comércio e serviços, é de acrescentar a instalação, a condução e a manutenção de sistemas técnicos.

Os compostos orgânicos voláteis, são uma das maiores fontes de contaminação da QAI e podem ser provenientes, em grande parte, dos materiais utilizados na área da construção. Estes, quando presentes em ambientes interiores, podem atingir concentrações cinco vezes superiores às encontradas no exterior. Segundo o ASHRAE *Standard* 62.1-2019 (ANSI, 2007), existem alguns níveis de referência dos vários compostos que podem ser encontrados em espaços interiores e que devem ser respeitados. Neste *Standard* podem encontrar-se valores de referência para compostos químicos em ambientes interiores. A Figura 9, ilustra uma das tabelas do ASHRAE onde se podem verificar-se valores comparativos entre Regulamentos específicos e os adotados na Europa, sugeridos pela WHO. Por outro lado, e mais especificamente, a Figura 10, apresenta valores específicos para ambientes de cariz hospitalar, descrevendo as taxas de fornecimento de ar exterior aceitável, necessário para uma adequada qualidade de ar interno.

TABLE B-1 Comparison of Regulations and Guidelines Pertinent to Indoor Environments^a
(The user of any value in this table should take into account the purpose for which it was adopted and the means by which it was developed.)

	Enforceable and/or Regulatory Levels				Non-Enforced Guidelines and Reference Levels		
	NA AQS/EPA (Ref. B-4)	OSHA (Ref. B-5)	MAK (Ref. B-2)	Canadian (Ref. B-8)	WHO/Europe (Ref. B-11)	NIOSH (Ref. B-13)	ACGIH (Ref. B-1)
Carbon dioxide		5000 ppm	5000 ppm 10,000 ppm [1 h]	3500 ppm [L]		5000 ppm 30,000 ppm [15 min]	5000 ppm 30,000 ppm [15 min]
Carbon monoxide ^c	9 ppm ^g 35 ppm [1 h] ^g	50 ppm	30 ppm 60 ppm [30 min]	11 ppm [8 h] 25 ppm [1 h]	90 ppm [15 min] 50 ppm [30 min] 25 ppm [1 h] 10 ppm [8 h]	35 ppm 200 ppm [C]	25 ppm
Formaldehyde ^h		0.75 ppm 2 ppm [15 min]	0.3 ppm 1 ppm ⁱ	0.1 ppm [L] 0.05 ppm [L] ^b	0.1 mg/m ³ (0.081 ppm) [30 min] ^p	0.016 ppm 0.1 ppm [15 min]	0.3 ppm [C]
Lead	1.5 µg/m ³ [3 months]	0.05 mg/m ³	0.1 mg/m ³ 1 mg/m ³ [30 min]	Minimize exposure	0.5 µg/m ³ [1 yr]	0.050 mg/m ³	0.05 mg/m ³
Nitrogen dioxide	0.05 ppm [1 yr]	5 ppm [C]	5 ppm 10 ppm [5 min]	0.05 ppm 0.25 ppm [1 h]	0.1 ppm [1 h] 0.02 ppm [1 yr]	1 ppm [15 min]	3 ppm 5 ppm [15 min]
Ozone	0.12 ppm [1 h] ^f 0.08 ppm	0.1 ppm	j	0.12 ppm [1 h]	0.064 ppm (120 µg/m ³) [8 h]	0.1 ppm [C]	0.05 ppm ^k 0.08 ppm ^l 0.1 ppm ^m 0.2 ppm ⁿ
Particles ^e <2.5 µm MMAD ^d	15 µg/m ³ [1 yr] ^p 65 µg/m ³ [24 h] ^o	5 mg/m ³	1.5 mg/m ³ for <4 µm	0.1 mg/m ³ [1 h] 0.040 mg/m ³ [L]			3 mg/m ³ [C]
Particles ^e <10 µm MMAD ^d	50 µg/m ³ [1 yr] ^p 150 µg/m ³ [24 h] ^o		4 mg/m ³				10 mg/m ³ [C]
Radon				800 Bq/m ³ [1 yr]			
Sulfur dioxide	0.03 ppm [1 yr] 0.14 ppm [24 h] ^e	5 ppm	0.5 ppm 1 ppm ⁱ	0.38 ppm [5 min] 0.019 ppm	0.048 ppm [24 h] 0.012 ppm [1 yr]	2 ppm 5 ppm [15 min]	2 ppm 5 ppm [15 min]
Total Particles ^e		15 mg/m ³					

Figura 9 – Comparação entre Regulamentos e Guias de Orientação para ambientes interiores (ANSI, 2007).

TABLE E-1 Outdoor Air Requirements for Ventilation of Health Care Facilities (Hospitals, Nursing and Convalescent Homes)*

Application	Estimated Maximum** Occupancy P/1000 ft ² or 100 m ²	Outdoor Air Requirements				Comments
		cfm/ person	L/s · person	cfm/ft ²	L/s · m ²	
Patient rooms	10	25	13			Special requirements or codes and pressure relationships may determine minimum ventilation rates and filter efficiency. Procedures generating contaminants may require higher rates.
Medical procedure	20	15	8			
Operating rooms	20	30	15			
Recovery and ICU	20	15	8			
Autopsy rooms	20			0.50	2.50	Air shall not be recirculated into other spaces.
Physical therapy	20	15	8			

Figura 10 – Tabela de Requisitos de Ar Exterior para ventilação em espaços hospitalares (ANSI, 2007).

2.2.5 Health Technical Memorandum – HTM British Standard

No ponto anterior foi feita uma breve descrição dos regulamentos pelos quais, grande parte dos desenvolvimentos na área do AVAC, se regem.

Tendo em conta com a especificidade deste projeto, bem como o contexto onde o mesmo se insere, é importante fazer uma breve descrição do HTM *British Standard*, lembrando que o projeto foi desenvolvido em Gibraltar, um território ultramarino Britânico localizado na costa sul de Espanha. Tratando-se de um território pertencente ao Reino Unido, existem algumas normas estabelecidas pelo próprio país que devem ser respeitadas, nas diversas áreas envolvidas na construção de edifícios. Os Estados Unidos da América (EUA) e o Reino Unido desde sempre foram considerados como dois países “separados” por um idioma comum e o estabelecimento de diferentes padrões nas práticas de design em sistemas de ventilação. Embora alguns conceitos se mantenham comuns a ambos os países, nos EUA o ASHRAE é o standard utilizado enquanto que no UK é o HTM 03-01 (Travis R. English, Moeller Dick). O *Department of Health* deste país, prevê a existência de uma série de diretrizes (HTMs 01 a 08) (Figura 11) adaptadas a cada área de atuação, destacando-se para a área hidráulica/mecânica:

- *Health Technical Memorandum 04-01: Safe water in healthcare premises*
Part A: Design, installation, and commissioning.
- *Health Technical Memorandum 04-01: Safe water in healthcare premises*
Part B: Operational management

- *Health Technical Memorandum 04-01: Safe water in healthcare Premises*
Part C: Pseudomonas aeruginosa – advice for augmented care units
- *Health Technical Memorandum 04-01: Supplement*
Performance specification D 08: thermostatic mixing valves (healthcare premises).
- *Heating and ventilation systems - Health Technical Memorandum 03-01: Specialised ventilation for healthcare premises*
Part A: Design and validation (Department of Health, 2007);
- *Heating and ventilation systems - Health Technical Memorandum 03-01: Specialised ventilation for healthcare premises*
Part B: Operational management and performance verification (Department of Health / Estates and Facilities Division, 2007);
- *Health Technical Memorandum 05-01: Managing healthcare fire safety*

Perante as diretrizes mencionadas anteriormente, cada especialidade terá o compromisso de implementar as tarefas e desenvolver a sua atividade de acordo com os requisitos fornecidos. Para a implementação de um sistema AVAC, devem ser respeitados os fundamentos presentes nos HTMs 03, Partes A e B respetivamente. Os restantes *Standards* (HTMs 04 e 05) foram utilizados como suporte para o desenvolvimento de atividades adicionais neste projeto.

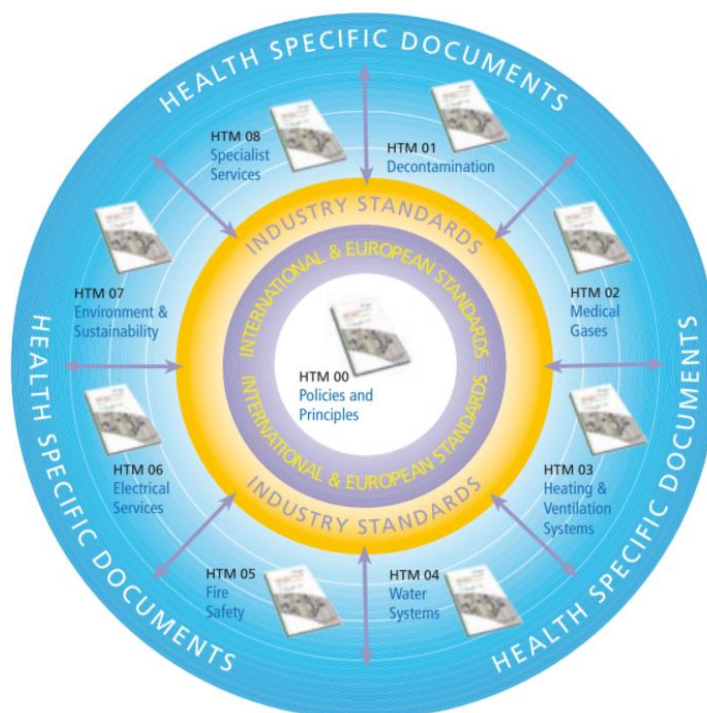


Figura 11 – Resumo dos *Health Specific Documents: Health Technical Memorandums* utilizados no Sistema do UK (Department of Health, 2007)

O HTM 03 (Partes A e B), fornece uma orientação sobre os requisitos legais, implicações no design, manutenção e operação de sistemas de ventilação em todos os tipos de instalações de saúde. As linhas de orientação deste documento aplicam-se tanto à construção de novas unidades de saúde como remodelações de instalações já existentes e deve ser utilizado idealmente por profissionais responsáveis pela gestão de projeto e de obra.

2.3 PLANO DE MANUTENÇÃO

De forma sucinta, a manutenção pode ser definida como o conjunto de ações destinadas a assegurar o bom funcionamento de máquinas e instalações, garantindo que são intervencionadas no momento certo e de acordo com as boas práticas técnicas e requisitos legais. Desta forma, pode evitar-se a perda de capacidade dos equipamentos assim como se evita a redução do rendimento (Cabral, 2009). A manutenção prevê que o conjunto de atividades que a descrevem, sejam capazes de restabelecer e/ou manter as condições de operacionalidade dos equipamentos por custos globais otimizados. De acordo com a norma BS EN 13306:2017 o conjunto de atividades que determinam os

objetivos, a estratégia e a responsabilidade respeitante à manutenção é chamada de gestão da manutenção (BSI, 2010). Através do planeamento, do controlo, da supervisão e da melhoria de métodos organizacionais, incluindo os aspetos económicos, é possível que a gestão da manutenção devolva resultados consideravelmente satisfatórios (De Carlo & Arleo, 2013). Numa só palavra, podemos afirmar que a gestão da manutenção é o planeamento. O plano de manutenção surge da necessidade desse planeamento e é definido como o conjunto estruturado de tarefas que compreendem as atividades, os procedimentos, os recursos e a duração necessária para executar a manutenção (BSI, 2010).

A gestão da manutenção está repleta de conceitos e definições que no seu todo compõem uma área complexa e para a qual, idealmente deve existir um departamento exclusivo e com gestores especializados.

Assim, e em forma de resumo, como resultado de um adequado processo de manutenção, são considerados:

- Equipamentos num estado de funcionamento seguro e eficiente;
- Equipamentos com disponibilidade e fiabilidade³ adequada às necessidades;
- A redução de custos totais em coerência com os pontos anteriores.

Existem três tipos de manutenção distinguidos por critérios como a causa da sua realização e a forma como devem ser executadas as intervenções.

- Manutenção preventiva;

As intervenções são executadas sem que tenha ocorrido qualquer avaria, sendo o seu objetivo repor os sistemas num estado de funcionamento mais eficiente.

- Manutenção corretiva.

Intervenções efetuadas após as avarias. Engloba a reparação de acidentes ocorridos e avarias. São considerados trabalhos imprevistos.

³ Disponibilidade é a aptidão de um bem para estar em estado de cumprir a função requerida em condições determinadas, em dado instante ou durante determinado intervalo de tempo. Fiabilidade é a aptidão de um bem para cumprir uma função requerida sob determinadas condições, durante um dado intervalo de tempo.

- Melhoria

Consiste na introdução de alterações nos sistemas, mas com o objetivo de melhorar a sua eficiência e a sua fiabilidade. Este tipo de manutenção é crucial na fase de arranque dos equipamentos/instalações pois é através das suas ações que são colocados os corretos parâmetros de funcionamento.

O processo de manutenção é composto por cinco níveis, cada um dos quais com diferentes funções (APIRAC, 2016).

1º Nível – Ajustagens simples previstas pelo fabricante sem desmontagem do equipamento ou substituição de elementos acessíveis;

Responsável: Técnico de Manutenção

2º Nível – Reparações através de substituição de componentes *standard* ou operações menores de manutenção preventiva;

Responsável: Técnico de Manutenção

3º Nível – Identificação e diagnóstico de avarias e reparação por substituição de componentes;

Responsável: Técnico Especializado

4º Nível – Trabalhos significativos de manutenção curativa (reparação), corretiva e preventiva.

Responsável: Técnico Especialista de Gestão Técnica Centralizada (GTC)

5º Nível – Trabalhos de renovação, de construção ou reparações em grande escala.

Responsável: Técnico Especialista de Gestão Técnica Centralizada (GTC)

2.3.1 Manutenção de Sistemas AVAC

Uma vez que os sistemas AVAC possuem alguma complexidade técnica e o valor associado ao investimento faz com que a manutenção surja como um processo chave e assuma um papel fundamental para manter a disponibilidade de equipamentos tão elevada quanto possível. A adoção de um plano de manutenção irá permitir otimizar intervalos de intervenções, exigindo, no entanto, um trabalho intensivo de análise de equipamentos e respetivas especificidades técnicas. Num sistema AVAC os custos na

adoção de uma estratégia de manutenção preventiva podem ser responsáveis por níveis de poupança consideráveis quando comparados com manutenções do tipo corretivo.

O plano de manutenção deve, idealmente, conter tarefas programadas e sistematizadas de acordo com intervalos e intervenções específicas:

Com a conclusão dos trabalhos, a obra deve ser documentada, tecnicamente, nos seus diversos componentes, de forma a garantir a informação sobre a mesma. Este tipo de documento Designa-se de Manual de Instalação e prevê a inclusão de informações como (APIRAC, 2016):

- **Telas Finais:** atualização da totalidade dos documentos constituintes do projeto de acordo com a realidade do que foi executado;
- **Fichas Técnicas de Equipamentos:**
 - ✓ Identificação do equipamento e respetiva função;
 - ✓ Catálogos e documentos de seleção de equipamento;
 - ✓ Instruções de funcionamento dos equipamentos;
 - ✓ Dados e características técnicas;
 - ✓ Tipo e frequência de revisões recomendadas pelo fabricante;
 - ✓ Peças de substituição recomendadas pelo fabricante.
- **Manual de Operação:** descrição de todos os conceitos para operar/interagir com o sistema implementado nos seus níveis distintos e componentes;
- **Manual de Manutenção:** descrição de todas as operações/procedimentos de manutenção, a sua periodicidade bem como recomendações e procedimentos;

Este último é considerado, no ponto de vista dos processos de manutenção, aquele que reflete a necessidade de definir uma estratégia de manutenção preventiva, criando o necessário plano de manutenção. A Figura 12 exemplifica, de forma geral, a configuração de como deve estar organizado um plano deste tipo.

Nº Obra: _____

Checklist

Programa de manutenção preventiva

Elaborado: _____
Data: _____ Pág 1/9

Cliente:		Contacto:	
Instalação:		Técnico:	
Morada:		Data:	

Descrição das acções a realizar	Visita	Ok	Inop	A benef	Observações/ A realizar
1. Unidades de Ar Não Autónomas – UTA					
Verificação da estrutura de toda a unidade para análise da corrosão através de controlo visual	(A)				
Verificação dos painéis amovíveis de toda a unidade controlando os dispositivos de aperto	(A)				
Controlo dos ventiladores (ver verificação de componentes)	(M)				
Controlo dos motores (ver verificação de componentes)	(M)				
Controlo dos Permutadores (ver verificação de componentes)	(M)				
Controlo do filtro de ar (ver verificação de componentes)	(M)				
Controlo dos equipamentos de comando	(M)				
Controlo dos apoios e fixações de toda a unidade verificando o desgaste e aperto mecânico	(M)				
Controlo do isolamento verificando a sua deterioração e fixação	(M)				
Verificação das válvulas de três vias (ver verificação de componentes)	(M)				
Lubrificações das dobradiças dos painéis	(M)				
Verificação de pontos de corrosão e correcção	(M)				
Ajuste do set point	(M)				

Figura 12 – Exemplo de *Check list* num plano de manutenção preventiva.

TRABALHO REALIZADO

3 TRABALHO REALIZADO

3.1 DESCRIÇÃO E LOCALIZAÇÃO

A realização deste projeto foi desenvolvida num dos maiores empreendimentos situados no território de Gibraltar, o complexo comercial EUROPORT (Figura 13).



Figura 13 - Registo fotográfico do empreendimento EUROPORT.

O EUROPORT caracteriza-se por ser um edifício de *design* moderno dominando grande parte da orla marítima de Gibraltar, com uma vista para a Baía de Algeciras (Espanha) e localizado no lado Oeste de Gibraltar (Figura 14). No total são nove os edifícios que perfazem o conjunto deste empreendimento e o seu interior é composto por inúmeros espaços comerciais, serviços, escritórios e cuidados de saúde.

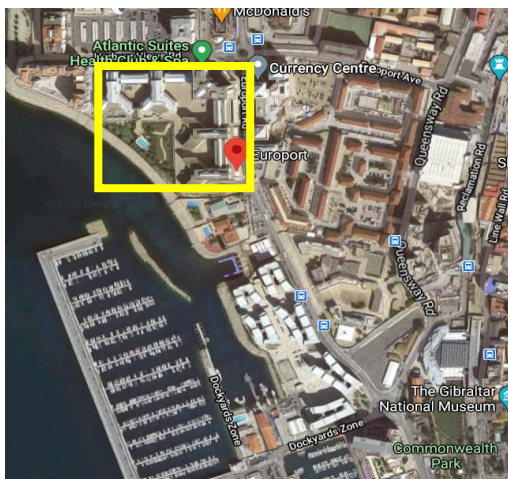


Figura 14 – “Google maps view” do posicionamento geográfico do EUROPORT.

Especificamente, o empreendimento EUROPORT é composto por (Figura 15):

- 4 Edifícios de escritórios (6, 7, 8 e 9)
- 1 Edifício de habitação (5)
- 4 Edifícios que constituem o Hospital “*St Bernard's Hospital*” (1, 2, 3 e 4)

Dos edifícios descritos, dois deles foram sujeitos ao processo de ampliação e um deles sofreu remodelação seguida de ampliação (Figura 16). Desta forma, foram consideradas três fases neste projeto, distintas pelas suas características funcionais e de requisitos:

Fase 1: *New Gibraltar Financial Services Centre* (FSC)– Ampliação dos serviços financeiros de Gibraltar. (destacado a vermelho)

Fase 2: *New Children's Health Centre* (CPCC) – Novo Centro de Saúde destinado ao apoio de crianças. (destacado a verde)

Fase 3: *New Primary Care Centre* (PCC) - Novo Centro de Saúde de Gibraltar. (destacado a azul)

Nos Anexos 1, 2 e 3 podem encontrar-se as plantas detalhadas de cada um destes projetos de ampliação/renovação.

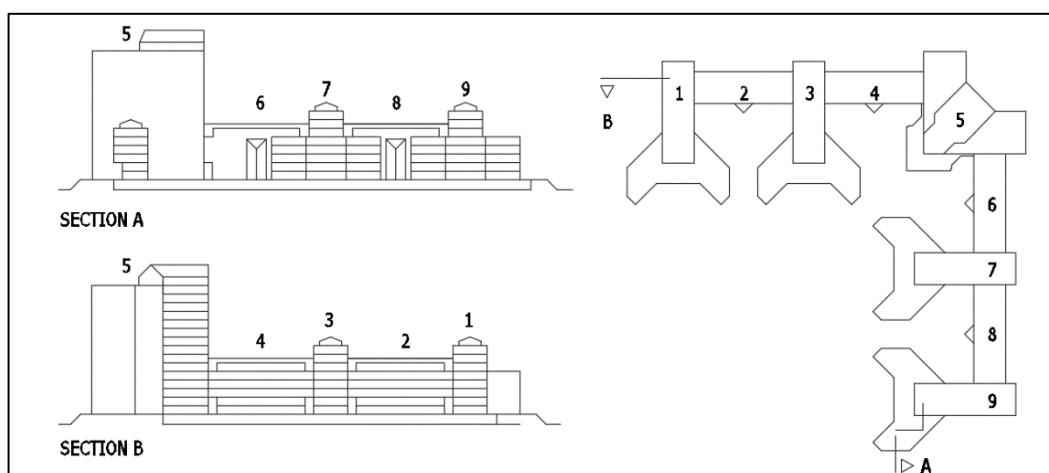


Figura 15 - Esquema de implantação do empreendimento EUROPORT.

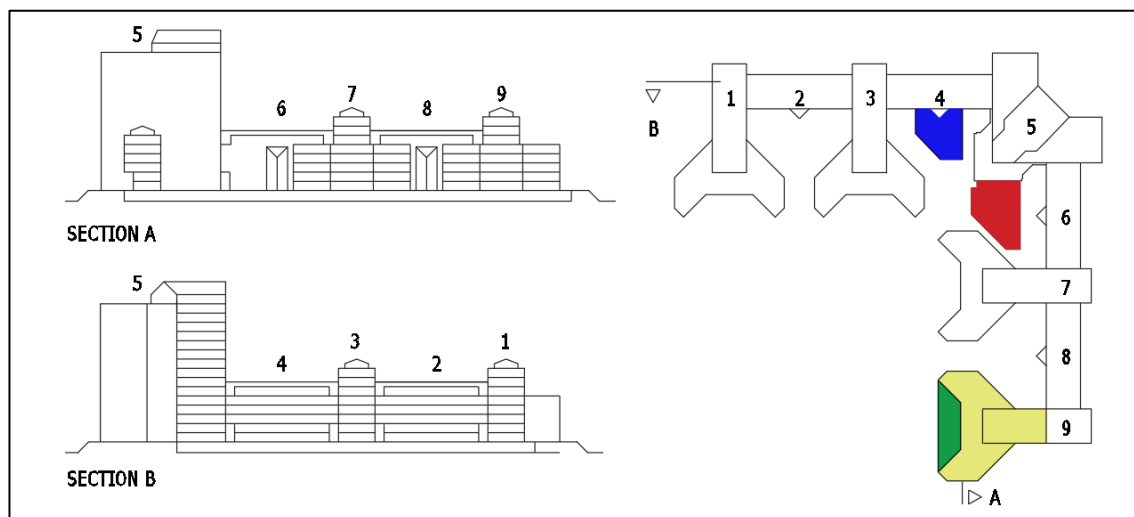


Figura 16 - Esquema de implantação das fases 1, 2 e 3 do empreendimento EUROPORT.

3.2 DIREÇÃO DE OBRA

No contexto em que este trabalho foi realizado, as responsabilidades na direção de obra incidiram nas especialidades de AVAC e Hidráulica. Os conceitos gerais aplicados às funções de DO, conforme foi apresentado no capítulo 2 deste trabalho, estiveram presentes em todo este processo de coordenação de obra.

Destacaram-se, nesta fase, como processos chave de sucesso a interação constante entre a equipa de projeto (externa) e equipas em obra, assim como as reuniões semanais com as restantes especialidades envolvidas. Atas destas reuniões podem ser consultadas nos Anexos deste trabalho e nelas são descritos os principais pontos abordados.

3.2.1 Análise de Projeto

A empresa Casais Gibraltar é uma empresa construtora com equipas multidisciplinares que agregam o conhecimento de várias especialidades e propõem as melhores soluções para a construção de qualquer empreendimento. No entanto, e salvo algumas exceções, os projetos das especialidades ficam habitualmente a cargo de empresas externas, libertando as equipas internas para o foco nas tarefas de planeamento e execução de

obra. Porém, o fato de muitos dos projetos serem desenvolvidos por equipas externas tem as suas desvantagens. Para uma obra refletir sucesso e ter bons níveis de produtividade, é necessário que seja feita a análise do projeto desenvolvido previamente a fim de serem evitadas complicações na fase de execução. Esta análise deve ser realizada, idealmente, em conjunto com as equipas de projeto e fiscalização para que sejam definidas as alterações necessárias antes da obra dar início e ser feita a correta revisão ao orçamento inicial.

A equipa responsável pelo projeto da obra ficou encarregue pelo levantamento de todas as informações globais do edifício como por exemplo, o propósito a que o espaço destina, a obtenção de dados climáticos e regimes de funcionamento. A equipa que implementa o projeto fica responsável pela revisão de todos esses detalhes, verificando a sua coerência no projeto.

3.2.1.1 Estudo do Projeto

O projeto proposto pela entidade externa consta do Anexo 4 a este documento e foi através deste que o estudo retificativo foi realizado, sendo posteriormente sujeito a proposta de alteração. Nesta fase de análise de projeto, a equipa responsável pela execução da obra e instalação de equipamentos, deve ter em conta a recolha de informações como:

- Análise dos edifícios em construção e dos sistemas AVAC a instalar

Devido à existência de uma série de sistemas AVAC, e formas de serem utilizados para controlar as condições ambientais no interior dos edifícios, a escolha da opção certa é uma tarefa muito importante e deverá ser feita pela equipa responsável pelo projeto, a qual deve considerar as características de cada tipo de sistema e optar por aquela que revele melhor desempenho

O edifício EUROPORT, é o único edifício em Gibraltar munido de um sistema de climatização por meio de água, o denominado *Chiller*. De uma maneira geral, em Gibraltar, os sistemas mais utilizados são os sistemas de expansão direta do tipo VRF, caracterizados por serem mais simples de montar e com maior variedade de oferta. Uma

vez que o *Chiller* possuía uma reserva de energia superior à dos requisitos das três novas ampliações, o cliente optou por ligar as novas ampliações ao sistema existente.

A equipa responsável pelo projeto não revelou muita experiência na manipulação destes novos ajustes e nas especificações de dimensionamento das redes “*Chilled Water*” e “*heating*”. Esta fase revelou ser uma boa oportunidade para cultivar a confiança entre as várias partes interessadas uma vez que foi desenvolvido muito trabalho entre equipas.

- Especificações de Construção

Informação pormenorizada das características técnicas dos equipamentos, materiais a aplicar e detalhes da instalação de acordo com o apresentado no “*Equipment and Specifications*” (Anexo 5) e os HTMs *Bristish Standards*.

- Peças Desenhadas

Destacam-se os desenhos da obra, onde se localizam os circuitos aeráulicos, hidráulicos, esquemas de princípio, máquinas a instalar, dimensões e tudo o que seja relevante que o projetista especifique de modo que a que a equipa em obra possa compreender o objetivo de cada critério.

3.2.1.2 Caderno de Encargos: The M&E Critical Specifications

Nas três fases deste projeto não existiu o habitual Caderno de Encargos, mas sim um documento em formato de mapa simplificado com todos os requisitos da obra e principalmente das características técnicas de cada gabinete.

Um caderno de encargos é a peça do procedimento através da qual a entidade adjudicante dá a conhecer as condições técnicas e económicas para as quais está disposta a celebrar contrato e deve ser aceite pelos vários interessados como um todo, não podendo existir cláusulas que gerem algum tipo de divergência (Gonçalves et al, 2020)

As instalações estudadas corresponderam, maioritariamente, a gabinetes de ambiente hospitalar e os requisitos tiveram de ser revistos com a maior atenção possível através da consulta dos “*Room Data Sheets*” específicos de cada espaço (Anexo 6). As

informações contidas nestes documentos foram resumidas e compiladas dando origem à criação do “*The M&E Critical Specifications*” que pode ser consultado no Anexo 7 deste trabalho. Neste, constam informações como, por exemplo:

- Tipo de ventilação (Extração e Insuflação);
- Tipo de pressão (positiva, negativa ou nula);
- Variação de temperatura;
- Temperatura ambiente;
- Tipo de Filtragem do ar;
- Taxa de renovação de ar.

3.2.1.3 Análise de erros e omissões

Dando continuidade à fase de análise de projeto nas suas diversas vertentes, surgem os conceitos: erros e omissões do projeto inicial.

Os erros e omissões constituem uma parte crítica nesta fase do processo uma vez que implicam a possibilidade de existirem alterações aos orçamentos inicialmente previstos. Aqui, a função do DO é de extrema importância pelo facto de poderem ser evitados prejuízos que seriam identificáveis apenas no decorrer da obra. A verificação do mapa de quantidades em comparação com o especificado nos desenhos de projeto possibilita a deteção de erros e omissões. Ou seja, ambos constituem as incoerências resultantes daquilo que estava previsto no projeto, mas que afinal não consta nos mapas de quantidades.

Durante esta análise, foram detetados alguns erros e omissões que foram posteriormente discriminados num documento que expõe, de forma organizada, a especialidade, a obra em questão, a dúvida levantada, a respetiva descrição e o responsável pela futura resposta. A este documento foi atribuído o nome de “*Mechanical Clarifications*” (Figura 17).

Após o preenchimento completo deste documento, é solicitado o pedido de esclarecimento ao gabinete de projeto, habitualmente via email.

 Europort Buildings extension (PCC, CPCC and FSC) Design Issues						
Issue number	Specialty	Building	Issue	Date	Description	To answered by
1	Plumbing	FSC and CPCC	MATERIAL ACOUSTICALLY LAGGED on sensitive areas. Areas to be defined.	13/06/2018	Note 13: ALL DRAINAGE PIPEWORK PASSING THROUGH NOISE SENSITIVE AREAS THEY SHALL BE IN ACOUSTIC HDPE PLASTIC MATERIAL ACOUSTICALLY LAGGED AND BOXED IN TO THE SATISFACTION OF THE ARCHITECT. Can you please identify the noise sensitive areas?	Ramboll
2	Ventilation	FSC	Ground floor ventilation layout	13/06/2018	The drawing does not contain the ventilation layers.	Ramboll
3	Ventilation	FSC	BUILDING STANDARDS (SCOTLAND)	25/06/2018	Drawing 310000176-RAM-FSC-00-DR-M-00500 refers: "ALL VENTILATION INSTALLATIONS TO BE IN ACCORDANCE WITH THE BUILDING STANDARDS (SCOTLAND) REGULATIONS 2010 ". Please inform the need for Scottish building standards.	Ramboll
4	Electrical	FSC, CPCC and PCC	Electric water heaters	13/06/2018	Electrical supply to water heaters must be marked on power supply drawings.	Ramboll
5	Heating	FSC, CPCC and PCC	Chilled water layout	13/06/2018	Note11: ALL PIPEWORK SHALL BE INSULATED WITH KAIFLEX KKPLUS IN ACCORDANCE WITH B55422:2001. ALL INSULATION SHALL BE PAINTED WHITE. Can we know why and for what we need to paint the insulation?	Ramboll
6	Air Conditioning	FSC	BMS not predicted on any building	15/06/2018	Drawing RAM-FSC-00-DR-M-00300 refers that "Automatic controls BMS to be carried out by Honeywell". As far as we know there is no BMS on FSC building.	Ramboll
7	Air Conditioning	FSC	Hot water for ambient heating	15/06/2018	There is no hot water for ambient heating in FSC. The ambient heating is made with electric resistances. Please correct drawings.	Ramboll
8	Air Conditioning	FSC	Chilled water pipe material	15/06/2018	Drawing RAM-FSC-00-DR-M-00300 refers The use of ABS to B55391-1 for chilled water pipework. The Client's required pipework is in threaded galvanized steel. Please correct drawings.	Ramboll
9	Air Conditioning	FSC	Insulation brand and type	15/06/2018	Drawing RAM-FSC-00-DR-M-00300 refers the use of Kaiflex KKPlus insulation. The Client's requirement is longitudinal self bonded elastomeric rubber, preferably Armacell brand.	Ramboll
10	Air Conditioning	FSC	Too many commissioning sets	15/06/2018	Being the commissioning sets composed with a dynamic balancing valve it is our opinion that there is no need to install in every branch a commissioning set. One per fan coil unit is sufficient.	Ramboll
11	Air Conditioning	CPCC	BMS not predicted on any building	25/06/2018	Drawing 310000176-RAM-CPCC-00-DR-M-00300 refers: "AUTOMATIC CONTROLS BMS TO BE CARRIED OUT BY HONEYWELL ". No BMS System is considered on CPCC building.	Ramboll
12	Plumbing	CPCC	BUILDING STANDARDS (SCOTLAND)	25/06/2018	Drawing 310000176-RAM-CPCC-00-DR-P-00300 refers: "ALL ABOVE GROUND DRAINAGE SERVICES SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE BUILDING STANDARDS (SCOTLAND) REGULATIONS, LATEST AMENDMENT, PART M ... ". Please inform the need for Scottish building standards.	Ramboll

Figura 17 – Lista de esclarecimentos ao projeto: *Mechanical Clarifications*

3.2.1.4 Orçamento retificado e sugestões de alteração ao projeto inicial

Do ponto anterior, e após o pedido de esclarecimento ao gabinete de projeto, as respostas foram recebidas num prazo médio de quinze dias (Figura 18). Com todas as informações necessárias foi possível avançar para proposta de alteração e a realização do orçamento retificativo (Anexo 8) que serviu de base para o planeamento e execução das obras.

 Europort Buildings extension (PCC, CPCC and FSC) Design Issues						
Issue number	Specialty	Building	Issue	Date	Description	To answered by
1	Plumbing	FSC and CPCC	MATERIAL ACOUSTICALLY LAGGED on sensitive areas. Areas to be defined.	13/06/2018	Note 13: ALL DRAINAGE PIPEWORK PASSING THROUGH NOISE SENSITIVE AREAS THEY SHALL BE IN ACOUSTIC HDPE PLASTIC MATERIAL ACOUSTICALLY LAGGED AND BOXED IN TO THE SATISFACTION OF THE ARCHITECT. Can you please identify the noise sensitive areas?	Ramboll
2	Ventilation	FSC	Ground floor ventilation layout	13/06/2018	The drawing does not contain the ventilation layers.	Ramboll
3	Ventilation	FSC	BUILDING STANDARDS (SCOTLAND)	25/06/2018	Drawing 310000176-RAM-FSC-00-DR-M-00500 refers: "ALL VENTILATION INSTALLATIONS TO BE IN ACCORDANCE WITH THE BUILDING STANDARDS (SCOTLAND) REGULATIONS 2010 ". Please inform the need for Scottish building standards.	Ramboll
4	Electrical	FSC, CPCC and PCC	Electric water heaters	13/06/2018	Electrical supply to water heaters must be marked on power supply drawings.	Ramboll
5	Heating	FSC, CPCC and PCC	Chilled water layout	13/06/2018	Note11: ALL PIPEWORK SHALL BE INSULATED WITH KAIFLEX KKPLUS IN ACCORDANCE WITH B55422:2001. ALL INSULATION SHALL BE PAINTED WHITE. Can we know why and for what we need to paint the insulation?	Ramboll
6	Air Conditioning	FSC	BMS not predicted on any building	15/06/2018	Drawing RAM-FSC-00-DR-M-00300 refers that "Automatic controls BMS to be carried out by Honeywell". As far as we know there is no BMS on FSC building.	Ramboll
7	Air Conditioning	FSC	Hot water for ambient heating	15/06/2018	There is no hot water for ambient heating in FSC. The ambient heating is made with electric resistances. Please correct drawings.	Ramboll
8	Air Conditioning	FSC	Chilled water pipe material	15/06/2018	Drawing RAM-FSC-00-DR-M-00300 refers The use of ABS to B55391-1 for chilled water pipework. The Client's required pipework is in threaded galvanized steel. Please correct drawings.	Ramboll
9	Air Conditioning	FSC	Insulation brand and type	15/06/2018	Drawing RAM-FSC-00-DR-M-00300 refers the use of Kaiflex KKPlus insulation. The Client's requirement is longitudinal self bonded elastomeric rubber, preferably Armacell brand.	Ramboll
10	Air Conditioning	FSC	Too many commissioning sets	15/06/2018	Being the commissioning sets composed with a dynamic balancing valve it is our opinion that there is no need to install in every branch a commissioning set. One per fan coil unit is sufficient.	Ramboll
11	Air Conditioning	CPCC	BMS not predicted on any building	25/06/2018	Drawing 310000176-RAM-CPCC-00-DR-M-00300 refers: "AUTOMATIC CONTROLS BMS TO BE CARRIED OUT BY HONEYWELL ". No BMS System is considered on CPCC building.	Ramboll
12	Plumbing	CPCC	BUILDING STANDARDS (SCOTLAND)	25/06/2018	Drawing 310000176-RAM-CPCC-00-DR-P-00300 refers: "ALL ABOVE GROUND DRAINAGE SERVICES SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE BUILDING STANDARDS (SCOTLAND) REGULATIONS, LATEST AMENDMENT, PART M ... ". Please inform the need for Scottish building standards.	Ramboll

Figura 18 – Lista de respostas aos pedidos de esclarecimento do *Mechanical Clarifications*

3.2.1.5 Novos layouts

No decorrer das fases mencionadas anteriormente foram surgindo outros pedidos de alterações ao projeto inicial, requisitadas pela administração das entidades e das quais se destacam maioritariamente: criação de novos gabinetes médicos, espaços maiores, junção de gabinetes, etc. Ao ser necessário proceder a estas novas alterações foram solicitados os novos *layouts* pretendidos para se proceder à respetiva análise e execução de projeto. Esta fase ficou a cargo da equipa de preparação do gabinete de mecânica da Casais Gibraltar e foram revistos os requisitos de hidráulica e AVAC. Os projetos finais que contemplam estas alterações podem ser consultados no Anexo 9 deste trabalho.

3.2.1.6 Revisão dos Equipamentos

Para as alterações referidas no ponto anterior, foi efetuada uma revisão ao dimensionamento dos equipamentos e consequentemente à quantidade de material necessário uma vez que os espaços foram ampliados/reduzidos e/ou transferidos para outro edifício com características técnicas diferentes. Com estas alterações surgiu também a necessidade de recalcular os novos caudais de ar a insuflar e a extrair (Anexo 10) dando origem ao aumento de potência da UTAN, uma vez que os caudais de ar estão diretamente relacionados com o volume do espaço e a taxa de renovação de ar (estabelecida pelo HTM 03-01 dos *British Standards*).

3.2.1.7 Aprovação de Equipamentos e Materiais

Os equipamentos e materiais selecionados nas fases anteriores devem ser sujeitos a aprovação por parte da fiscalização/dono de obra.

Para cada equipamento/material, foi criado um documento designado por “*Purchasing Technical Specifications Materials or Supplies*”(PTS) onde consta o nome, a marca, o modelo e o local da instalação (Figura 19). Depois de devidamente preenchido com as características gerais do equipamento, este documento é enviado à fiscalização para aprovação juntamente com os respetivos catálogos, fichas técnicas e certificados.

	Purchasing Technical Specifications Materials or Supplies	N.º/REF.º 220 D
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1. TO BE COMPLETED BY THE CONTRACTOR

CLIENT:	Europort International Holdings LTD and Europort Five Limited		
PROJECT NAME:	☒ eCC	☐ CPCC	FSC ☐
EMPLOYER AGENT:	Europort		
CONTRACTOR:	CASAIS		

GENERAL INFORMATION OF THE MATERIALS OR SUPPLIES:

NAME:	Extract grilles - According to the return of TROX units without ducts as GHA recommendations and installations		
MANUFACTURER:	Lindab PCY		
LOCATION ON SITE:	On ceiling		

DOCUMENTS ATTACHED:

Sample	☐	Technical Datasheet	☒
CE marking	☐	Certificates	☐
Homologation Documents:	☐	Others:	☐

CONTRACTOR (signature): Carlos Esteves DATE: 23/10/2018

2. TO BE COMPLETED BY THE EMPLOYER AGENT

RECEPTION DATE:	24.10.2018	SIGNATURE:	Lars Kure
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FINAL DECISION

A) No Comment ☒
 B) Comments as Noted ☐
 C) Resubmit ☐

COMMENTS:

EMPLOYER AGENT (signature): Lars Kure DATE: 25.10.2018

Figura 19 – PTS – “Purchasing Technical Specifications Materials or Supplies”

3.2.2 Planeamento

O planeamento corresponde a um conjunto de tarefas que, agregadas, permitem definir temporalmente, os fluxos de execução das atividades.

Aqui decorre uma das fases mais importantes do projeto da obra. Um planeamento bem desenvolvido permite que se atinjam resultados positivos, refletidos no balanço final da obra através da otimização de recursos e o cumprimento dos prazos estabelecidos inicialmente.

Nesta fase, a interação, com as restantes especialidades, é a palavra de sucesso uma vez que permite o ajuste de prazos de execução e dimensão de equipas de acordo com os trabalhos desenvolvidos também pelas restantes equipas envolvidas na obra e assim minimizar possíveis incompatibilidades. O plano de trabalhos resume o conjunto de informações que permitem estabelecer prazos de projeto e, sobretudo, definir datas de tarefas que estão dependentes de terceiros.

No caso deste projeto, destacou-se a comunicação entre as equipas de mecânica (hidráulica e AVAC), eletricidade, acabamentos e estruturas.

A cada especialidade, foi solicitado o envio de um mapa com o planeamento das respetivas atividades a desenvolver, como exemplificado na Figura 20.

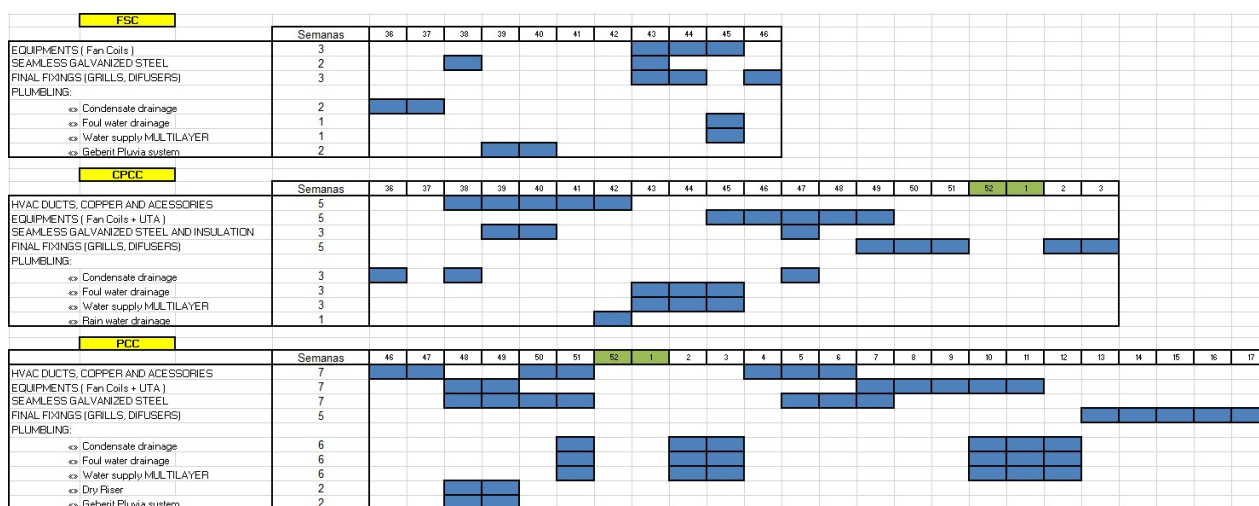


Figura 20 -Resumo-esquema do planeamento das três fases de obra) FSC, CPCC e PCC)

■ Semana Trabalho ■ Semana Férias

3.2.2.1 Preparação de Obra

Construir em Gibraltar, acarreta uma série de questões burocráticas, quer por solicitação dos investidores/donos de obra, que muitas vezes são oriundos de outros países do mundo, ou por imposição de regulamentos do próprio país. Como já referido anteriormente, Gibraltar rege-se por regulamentos do Reino Unido, nos quais existem algumas diferenças para o resto dos países da EU.

Foi necessária a elaboração de um dossier técnico (AVAC, drenagens e instalação de equipamentos) onde constaram informações dos materiais e equipamentos a aplicar e o modo de manusear os mesmos de acordo com os requisitos.

Nesta fase do projeto, destaca-se o desenvolvimento das atividades de planeamento descritas seguidamente.

Pedidos cotação e prazos de entrega

Nesta esta altura, já se encontram reunidas todas as informações necessárias para a realização dos mapas comparativos (Figura 21). Estes mapas são criados e preenchidos pelo DO e nele constam informações como: quantidades, características e preço dos materiais e equipamentos previstos e necessários à execução da obra. É neste documento que o DO faz o estudo comparativo entre os possíveis fornecedores, registrando as diferenças de preço e a disponibilidade para entrega. Numa fase posterior, este documento é enviado para a equipa responsável pela negociação com fornecedores, e deve apresentar a seleção do para o fornecedor mais competitivo numa relação de preço/prazo entrega.

[illegible]

Figura 21 - Esquema de mapa comparativo.

Levantamento de necessidades

O levantamento de necessidades em obra pode abranger um conjunto de tópicos distintos pela sua natureza e função. Este processo foi dirigido pelo DO, responsável por avaliar o plano estabelecido até então e acrescentar os elementos em falta. A necessidade de equipamentos e material foi, na sua grande maioria, avaliada durante a

fase de projeto, mas é nesta fase que se garante a existência de tudo o que é necessário fazendo uma revisão às listas anteriores. Esta tarefa foi realizada em conjunto com o Encarregado de Obra (EO) que, com a sua experiência no terreno, permite estimar de forma mais precisa o conjunto de necessidades.

- **Materiais e Equipamentos**

A lista de materiais e equipamentos necessários à execução dos trabalhos das três fases, consta do Anexo 11, como exemplo. A lista fornecida é designada de “Requisição interna de material e Equipamento” (RIM) é a lista final com a inclusão da revisão das necessidades considerando também os pequenos acessórios fundamentais na fase de montagem dos equipamentos, e que até aqui não tinham sido contabilizados.

A Casais Gibraltar possui um departamento responsável pela negociação de preços e comparação de fornecedores. No entanto, o DO deve informar qual o preço seco⁴ do equipamento/material a adquirir para que a negociação possa ser realizada sempre abaixo desse valor. Este dado, consta do mapa comparativo elaborado anteriormente e, idealmente, deve ser enviado juntamente com o RIM.

- **Mão de Obra**

O planeamento de atividades partilhado pelas especialidades envolvidas, permitiu que a estimativa de cálculo da necessidade de mão de obra se tornasse uma tarefa mais simples e precisa.

As tabelas (1 a 3) seguintes permitem estabelecer a proporção de mão de obra necessária consoante as horas de trabalho semanais requeridas, para equipas de AVAC e hidráulica e para cada uma das três obras, separadamente.

É importante referir que, como em qualquer obra, os imprevistos estão sempre presentes no decorrer dos trabalhos e por isso existiu a necessidade de proceder ao reajuste de MO necessária mais do que uma vez, em grande parte devido às datas previstas de chegada de equipamentos e materiais. A fase de planeamento, pode dizer-

⁴ Preço seco: Preço de venda ao cliente (dono de obra) do equipamento/material incluindo as taxas de importação e câmbio, se aplicável.

se que esteve presente do início ao fim dos trabalhos uma vez que as tarefas da equipa foram constantemente afetadas por terceiros como fornecedores e outras especialidades. O ajuste do planeamento, dia a dia, tornou-se uma tarefa fundamental.

Tabela 1 – Planeamento inicial das necessidades de MO na fase FSC.

New Gibraltar Financial Services Centre (FSC)

Data	
INÍCIO DOS TRABALHOS	04/09/2018
FIM DOS TRABALHOS	15/11/2018
Fim da Obra:	18/12/2018
Total de Semanas:	11
Horas trabalho / Semana:	55

	MO Total (Horas)	Total Semanas / Equipa** (MO Total / 55 horas)
AVAC	193*	4
HIDRÁULICA	98,84*	2
Total:		6 Semanas

*Previsão MO necessária de acordo com o orçamento

** Equipa = Oficial + Ajudante (2 Elementos)

Pela análise dos resultados obtidos para o número de trabalhadores necessários à execução da obra nos prazos previstos verificou-se que a obra estaria concluída em 4 semanas com uma equipa de AVAC e em 2 semanas com uma equipa de Hidráulica, conseguindo finalizar a obra antes do prazo inicialmente previsto. No entanto, na fase de execução este cálculo pode sofrer alterações por imprevistos de várias naturezas.

Tabela 2 - Planeamento inicial das necessidades de MO na fase CPCC.

New Children's Health Centre (CPCC)

Data	
INÍCIO DOS TRABALHOS	03/09/2018
FIM DOS TRABALHOS	18/01/2019
Fim da Obra:	18/02/2019
Total de Semanas:	18
Horas trabalho / Semana:	55

	MO Total (Horas)	Total Semanas / Equipa** (MO Total / 55 horas)
AVAC	582,5*	11
HIDRÁULICA	445,71*	9
Total:		20 Semanas

*Previsão MO necessária de acordo com o orçamento

** Equipa = Oficial + Ajudante (2 Elementos)

Para esta obra, verificou-se que o cálculo da necessidade de MO não seria suficiente para concluir os trabalhos nos prazos previstos uma vez que seriam necessárias 20 semanas para executar as tarefas de AVAC e Hidráulica quando estavam disponíveis apenas 18 semanas. No entanto, os cálculos apresentados foram feitos por excesso, ou seja, se multiplicarmos 11 semanas por 55 horas semanais obtemos um resultado de 605 horas de MO Total e o mesmo caso para a Hidráulica (495 horas de MO Total). A verdade é que daqui concluímos que estavam apenas cerca de 73 horas disponíveis para além das 18 semanas o que significa mais uma semana e 18 horas não perfazendo o total de 2 semanas necessárias. Desta forma, o ajuste de MO durante a fase de execução da obra foi inevitável, tendo em conta que existem sempre imprevistos. Esta análise será feita no capítulo seguinte com maior detalhe.

Tabela 3 - Planeamento inicial das necessidades de MO na fase PCC.

New Primary Care Centre (PCC)

Data	
INÍCIO DOS TRABALHOS	19/11/2018
FIM DOS TRABALHOS	18/04/2019
Fim da Obra:	30/05/2019
Total de Semanas:	20
Horas trabalho / Semana:	55

	MO Total (Horas)	Total Semanas / Equipa** (MO Total / 55 horas)
AVAC	1630,4*	30
HIDRÁULICA	987,15*	18
Total:		48 Semanas

*Previsão MO necessária de acordo com o orçamento

** Equipa = Oficial + Ajudante (2 Elementos)

Para esta obra foi claro que o resultado obtido, na teoria, não seria suficiente para executar a obra dentro do prazo uma vez que existe uma diferença de 28 semanas entre o necessário e o expectável. O ajuste a estes valores foi feito durante a fase de execução tendo em conta também a intervenção de outras especialidades, possíveis paragens, contratempos e ausência de equipamentos/material por falhas nas entregas.

3.2.3 Execução e Acompanhamento

Com a conclusão do planeamento de obra e aprovadas todas as condições para dar início à obra, passou-se à fase de execução. Durante a fase de execução o trabalho desenvolvido pelo EO é mais notório e neste projeto isso não foi exceção. O EO foi o responsável pela coordenação das equipas, acompanhando o desenvolvimento dos trabalhos pelo fato de estar numa posição privilegiada dos acontecimentos, ter a capacidade de agir de forma mais imediata a qualquer situação imprevista e ser o elo de

comunicação em obra. A relação DO-EO, nesta fase é crucial e vai refletir os bons ou maus resultados de execução da obra.

3.2.3.1 Receção de materiais e equipamentos

A chegada de matérias à obra é uma constante diária em toda a fase de execução. Os materiais e equipamentos não são rececionados todos ao mesmo tempo e no mesmo dia, por isso é necessário o ajuste de equipas e procedimentos a todo o instante como será explicado no próximo ponto.

Os materiais, à chegada, sofrem um processo de validação que conta com atividades como contabilização, confirmação de referências e estado físico (Figura 22). Este processo é realizado com o apoio da guia de transporte enviado pela empresa à qual foram adjudicados os bens. Nesta fase analisa-se a conformidade com a encomenda.



Figura 22 – Receção e contabilização de materiais.

O processo de confirmação do estado físico é de extrema relevância uma vez que, se for omitido, compromete a boa execução dos trabalhos de montagem. Esta validação deve ser feita no ato da receção para evitar a necessidade de pedido de novos materiais para substituição dos defeituosos assim como evitar custos adicionais não previstos no orçamento inicial. Em situações ideais, os materiais deveriam ser entregues devidamente limpos, embalados e protegidos de possíveis danos. Não sendo esta a prática que ocorre na realidade, cabe às equipas o cuidado de procederem ao

armazenamento de forma a cumprir os requisitos do DL n.º 118/2013 de 20 de Agosto ou de outras normas internacionais, como a BS EN 13779 ou a ASHRAE 62.1.

Nesta fase, foram detetadas algumas peças com defeitos (Figura 23), e foi feita a exposição ao fornecedor que se comprometeu a proceder à substituição dos mesmos.



Figura 23 - Verificação do estado físico dos materiais.

3.2.3.2 Coordenação de trabalhos de produção

A fase de produção correspondeu a cerca de 70% do total de trabalhos deste projeto. É nesta fase que se consegue perceber se a análise de projeto e o posterior planeamento vão funcionar de acordo com o previsto teoricamente.

Os primeiros materiais e equipamentos encontram-se disponíveis para dar início aos trabalhos e as equipas devem ser acompanhadas durante todo o processo de implementação das redes de água e de ventilação de forma a garantir a conformidade com as recomendações dos fabricantes e das normas previstas. Semanalmente, e sempre no mesmo dia, foi realizada uma reunião com o EO para debater assuntos gerais como datas previstas de entrega de equipamentos, falta/excesso de MO, datas de conclusão de tarefas e análise de possíveis anomalias de instalação. A ata presente no Anexo 12, mostra, em exemplo, um resumo deste tipo de reuniões.

Tendo sempre em consideração, o trabalho conjunto com as restantes especialidades a atuar em obra, resumem-se as tarefas a desenvolver na fase de produção:

- Redes Aeraúlicas, hidráulicas, de cobre e eletricidade;
- Montagem de equipamentos;
- Difusão;

- Ensaios de qualidade;
- Testes de arranque

É importante fazer referência ao facto de ter sido necessário ao ajuste de MO necessária à execução dos trabalhos no tempo previsto, por questões já referidas em pontos anteriores e como resultado das reuniões de coordenação semanais.

Assim, para cada uma das fases/obras foi feito o ajuste de MO exemplificado nas tabelas seguintes (Tabelas 4 a 6).

Distribuição Semanal de MO

Tabela 4 - Ajuste das necessidades de MO na fase FSC.

NEW GIBRALTAR FINANCIAL SERVICES CENTRE (FSC)

SEMANA Nº	35	36	37	38	39	40	41	42	43	44	45	46	47	Total
Nº TRABALHADORES	0	3	3	2	2	2	0	0	2	1	3	2	0	20

As semanas identificados com zero (0) no número de trabalhadores significam que, ou a obra esteve parada por motivos de execução de trabalhos de outras especialidades, ou ausência de chegada de equipamentos/materiais nos prazos previstos aos inicialmente estipulados.

Tabela 5 - Ajuste das necessidades de MO na fase CPCC

NEW CHILDREN'S HEALTH CENTRE (CPCC)

SEMANA Nº	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Total
Nº TRABALHADORES	0	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	0	44
SEMANA Nº	1	2	3	4	Total														
Nº TRABALHADORES	0	2	2	0	4														
																			Total 48

Tabela 6 - Ajuste das necessidades de MO na fase PCC.

NEW PRIMARY CARE CENTRE (PCC)

SEMANA Nº	46	47	48	49	50	51	52	Total
Nº TRABALHADORES	0	3	3	4	4	4	0	18

SEMANA Nº	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
Nº TRABALHADORES	0	4	6	6	6	6	6	6	5	5	5	5	5	5	5	3	0	78
	Total																	96

Rede Aerúlica

As redes aerúlicas estão relacionadas com os processos de insuflação, exaustão e retorno de ar para garantir a qualidade de ar interior. Estas redes permitem a extração de ar poluído nos espaços, proporcionando uma sensação de bem-estar e conforto.

A rede foi composta não só pelas UTAN, e respetivos ventiladores, mas também por um conjunto de condutas, grelhas e difusores responsáveis pela distribuição do ar por todo o edifício bem como pela exaustão do ar Interior. Durante a execução da obra, foi necessário proceder à alteração de traçados devido ao cruzamento com as restantes especialidades envolvidas. Este facto, levou ao redimensionamento de novas condutas com o auxílio do “Kit de cálculo e seleção SP” (Figura 24).

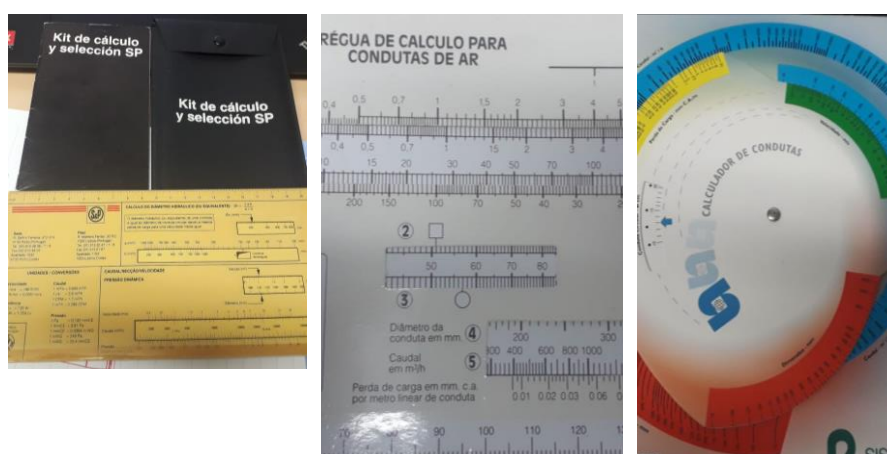


Figura 24 – Kit de cálculo e seleção SP para redimensionamento de condutas.

O Ar tratado proveniente da UTAN é insuflado nos gabinetes por meio de uma rede de condutas onde a sua difusão ocorre através de um difusor quadrangular de dimensão 600 mm x 600 mm.

A exaustão do ar de cada gabinete é realizada na parte superior do teto falso (o teto faz de pleno de captação) e a passagem do ar para cima do mesmo ocorre por meio de grelhas de passagem de ar com medidas 600 mm x 600 mm (Figura 25).

As redes devem permanecer isoladas após a instalação para evitar acumulação de sujidade até ao processo de arranque.



Figura 25 - Exemplo de instalação e montagem de condutas e difusores.

Montagem dos equipamentos

A montagem dos equipamentos deve fazer parte de um processo cuidado de alinhamento com a rede aerúlica e instalações elétricas. Uma correta execução, nesta fase, permite ganhos de tempo mais à frente nos trabalhos, com o surgimento de contratempos.

- **Unidade Fan Coil**

New Gibraltar Financial Services Centre (FSC)

O sistema implementado no FSC é classificado como sistema misto (Ar- Água). Foram instaladas nove unidades Fan Coil do tipo “cassete 4 vias” da marca *Flakt Woods* (Sabiana) (Figura 26), compostos por uma bateria de água gelada e um módulo de resistências elétricas.

New Children's Health Centre (CPCC)

Nesta obra foi implementado o mesmo sistema de climatização do descrito na fase anterior (FSC) com a instalação de quarenta e sete unidades Fan Coil.

Tratando-se de uma obra executada num centro de saúde destinado a crianças, foi necessário, adicionalmente, instalar uma UTAN a fim de serem cumpridos os requisitos de QAI estabelecidos.



Figura 26 - Unidade Fan Coil tipo Cassete 4 vias.

New Primary Care Centre (PCC)

Para a execução desta obra foi necessário aplicar todos os requisitos hospitalares definidos previamente, e já mencionados no capítulo 2 deste trabalho (HTM 03-01 Partes A e B). O sistema implementado manteve a característica Ar – Água, mas as unidades Fan Coil instaladas foram do tipo “condutas” (Figura 27) da marca Trox uma vez que este modelo, e marca, já se encontra instalado no restante edifício onde esta obra foi desenvolvida.



Figura 27 - Exemplo de unidade Fan Coil tipo condutas.

- **Kit hidráulico**

O *kit* hidráulico é utilizado para a efetuar a ligação das redes *chilled water* e *heating* às unidades *Fan Coil* e tem como objetivo principal proporcionar a segurança da instalação e do equipamento (Figura 28).



Figura 28 - Exemplo de montagem de *kit* hidráulico.

As peças constituintes deste *Kit* são as discriminadas na tabela que se segue (Tabela 7).

Tabela 7 – Discriminação dos acessórios constituintes do *Kit* Hidráulico.

Descrição	Marca	Referência	Imagem
2-port terminal unit valves+9:15	SIEMENS	VVP47.20-4	
3/4" ball valve make cim type 314	CIM	QA00201020	
3/4" ball valve make w/strainer make cim type 619	CIM	QD35101020	
3/8" automatic air release	Flamco	27750	
1/2" ta-trim 'a'	IMI TA	50 004-115	
Electrical actuator	Siemens	SSP61, 24V AC/DC, 0-10V DC control signal	

- **Unidade de Tratamento de Ar Novo (UTAN)**

Foram instaladas, nas fases do CPCC e PCC, o total de duas unidades UTAN, uma em cada fase.

As duas possuíam características muito similares, mas a da fase de construção do PCC exigiu a atenção extra ao cumprimento dos requisitos de certificação higiénica. Seguidamente é feita a descrição técnica das unidades instaladas em ambas as fases, AHU1 - *Air Handling Unit 1* (CPCC) e AHU2 - *Air Handling Unit 2* (PCC).

AHU1 (Figura 29)

- Chassi, estrutura e painéis

Constituída por três módulos, com uma estrutura de perfis de alumínio com painéis duplos em chapa aço *Aluzink*.

- Módulos de ventilação

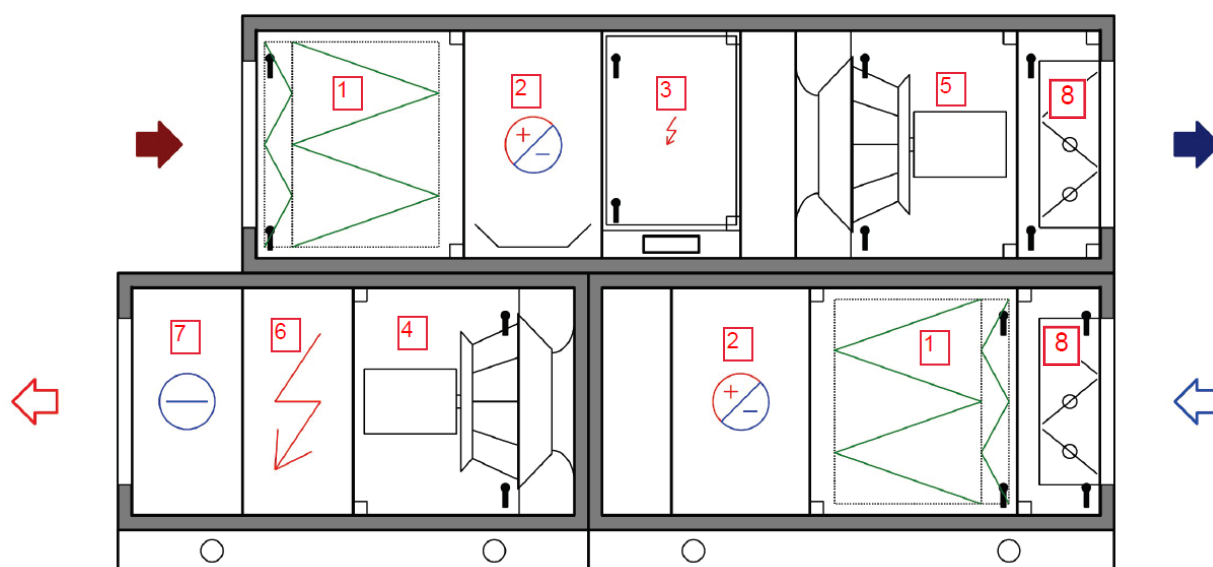
Constituídos por dois ventiladores centrífugos de transmissão direta “*Plug-Fan*”, Motor EC (*Electronically Commutated*).

- Módulos de Aquecimento e Arrefecimento

Compostos por uma bateria de água, tubos de cobre allhetados a alumínio e uma bateria de resistências elétricas (Aquecimento).

- Módulos de Filtragem

Utilização de um pré filtro G4 (Insuflação e Extração), um filtro F5 (Insuflação) e um filtro M5 (Extração).



1-Filtros; 2-Recuperador de calor; 3-Quadro de controlo; 4-Ventilador insuflação; 5- Ventilador de extração; 6-Bateria de água quente; 7-Bateria de água gelada; 8- Registro de caudal

Figura 29 – Esquema de princípio da Unidade de Tratamento de Ar Novo na fase CPCC.

- Recuperador de calor

De acordo com os requisitos hospitalares, para que não haja uma contaminação do ar novo dentro da UTAN, foi adotada a opção de um recuperador calor de baterias de forma a não existirem misturas do ar novo com o ar viciado. As duas baterias foram ligadas por um *kit* de recuperação hidráulica onde é feito o aproveitamento do calor de rejeitado para o aquecimento do Ar Novo (Figura 30).

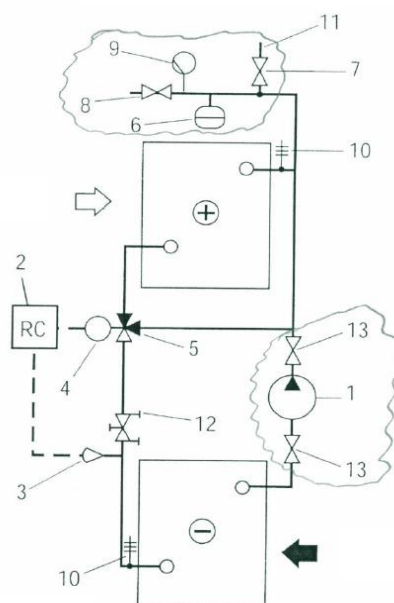


Figura 30 - Kit de recuperação hidráulica.

AHU2 (Figura 31)

1-Filtros; 2-Recuperador de calor; 3-Quadro de controlo; 4-Ventilador Extração; 5- Ventilador de Insuflação; 6-Bateria de Aquecimento; 7-Bateria de Água Gelada; 8-Registro de Caudal

Figura 31 - Esquema de princípio da Unidade de Tratamento de Ar Novo na fase PCC.

Como referido anteriormente, para esta instalação foram exigidos alguns pormenores que se destacam da primeira instalação. Para esta UTAN destacaram-se as seguintes exigências técnicas para uma UTAN com certificação higiénica:

- Unidade constituída por um fundo interior em aço inox, com suportes de baterias, filtros e ventiladores em aço inox (ou liga com alumínio);
- Unidade com registos interiores classe C4, em aço inox;
- Uma secção de entrada de ar com 600 mm de comprimento, com tabuleiro de condensados em aço inox e dreno (inclusão de drenos em todas as secções possíveis);
- Todas os módulos têm de ter secções vazias a montante e a jusante. As secções vazias deviam possuir, obrigatoriamente, um comprimento mínimo de 400 mm com porta, iluminação, visor e dreno;
- Filtros com iluminação, visor e dreno;
- Pré filtros classe M5 e filtros F9;
- Alhetas das baterias com espaçamento de 2,5 mm;
- Tabuleiro de condensados em aço inox com três inclinações;
- Atenuadores com septos removíveis e laváveis.
- Sifão em Vidro.

- **Close Control**

Nas fases 2 e 3 da obra (CPCC e PCC respetivamente) foram instalados dois sistemas de arrefecimento nas salas de *data center* com requisitos distintos e previamente selecionados pelo dono de obra.

Nesta fase, foi necessário respeitar os requisitos de ambiente que as salas de *data center* exigiam, pela sua natureza funcional. De destacar:

- Ventilação – Ar novo e extração;
- Pressão: nula
- Taxa de renovação de ar: 1,5 AC/h;
- Intervalo de temperatura: 18 – 25 °C;
- Temperatura ambiente: 19 °C;
- Humidade relativa: 30 – 55 %.

O sistema implementado na fase 2 (Figura 32) possibilita o arrefecimento por via de água gelada, em inglês “*cold water*” (CW), e por via de expansão direta (DX). Neste caso, a água funciona como principal fonte de arrefecimento e em caso de falha no sistema existe, como reserva, o sistema DX (Figura 33).

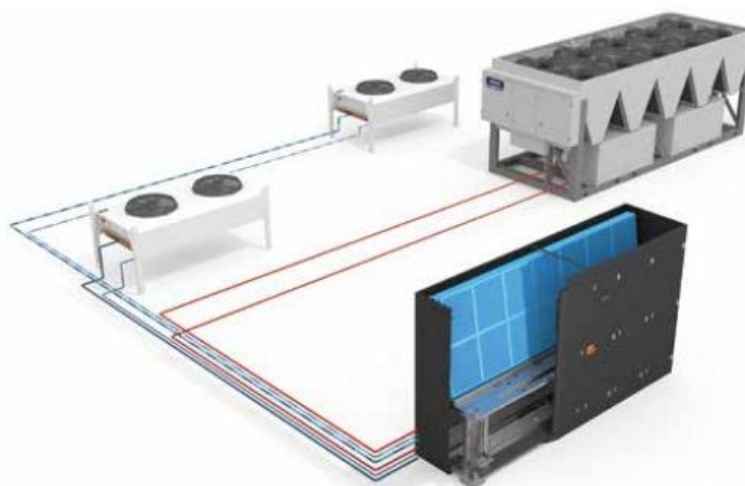


Figura 32 – Sistema tipo *Close Control* instalado no CPCC (Airedale® Datasheet)



Figura 33 – Sistema *Close Control* instalado no CPCC (AthenaAir)

No momento da realização do comissionamento⁵ não foi possível atingir os requisitos previamente estabelecidos para o espaço em questão. O valor da humidade relativa era de 65% e o sistema não correspondeu ao exigido devido à constante entrada de ar novo no espaço uma vez que o território de Gibraltar fica localizado numa zona com humidades a rondar os 80%. Como solução para este problema, optou-se por fechar a entrada de ar novo e a extração.

Relativamente à montagem deste sistema na fase 3 (PCC), o processo foi distinto uma vez que o sistema apenas possuía um circuito de arrefecimento – CW (Figura 34) e como *backup* à unidade foi instalado um sistema DX constituído por duas cassetes 4 vias (Daikin) (Figura 35).

⁵ Comissionamento = processo de arranque da unidade.



Figura 34 - Sistema tipo *Close Control* instalado no PCC (Airedale® Datasheet)



Figura 35 – Sistema DX para *backup* ao Close Control instalado no PCC (Fonte: Daikin)

Tal como na situação anterior, os valores para a humidade foram superiores ao estipulado, procedendo da mesma forma e optando-se por fechar a entrada de ar e extração.

- **Registos corta-fogo**

Os registos corta-fogo servem para isolar de forma automática zonas de fogo em sistemas de ventilação e ar-condicionado e podem ser montados em paredes e tetos (Figura 36).

A sua montagem tanto pode ser vertical como horizontal e é independente do sentido de passagem de ar.

O dispositivo de disparo interior e os órgãos de atuação e indicação exterior são facilmente removidos para inspeção e/ou substituição.

Os registos instalados continham fusível térmico de acionamento de fecho, quando a temperatura de 72°C é ultrapassada, e de acionamento manual.

Foram instalados fins de curso para que posteriormente se possa proceder à montagem de um quadro sinóptico com a informação de Aberto/Fechado.



Figura 36 - Tipo de registos corta fogo instalados.

- **Grelhas**

Para a seleção de grelhas de extração e difusores de insuflação (Figura 37), apenas se deve ter em conta características como o caudal de ar, alcance, perda de carga e níveis de pressão sonora admissíveis. (Anexo 14)



Figura 37 - Grelhas e difusores instalados.

- **Sistema “Chilled Water” e “Heating”**

Os circuitos de *Chilled Water* e *Heating* foram executados em tubagem de ferro galvanizado DIN 2440, sem costura e com um isolamento “*Kaiflex*” de 19 mm de espessura para evitar condensações (Figura 38).



Figura 38 – Circuito *Chilled Water* e *Heating* instalado PCC.

3.2.3.3 Realização de autos de medição

A realização de autos de medição faz parte de uma das tarefas mais importantes quando nos referimos a custos de produção. Esta tarefa foi executada mensalmente e resumiu-se a um acompanhamento financeiro dos recursos já aplicados em obra e dos que ainda faltam. Isto permite que, mensalmente, seja feita uma correta faturação até ao momento da conclusão da obra, permitindo seguir o processo de custos de obra de forma sistemática e rigorosa. Um exemplo de um auto de medição para este projeto pode ver-se no Anexo 13.

3.2.3.4 Fiscalização

A fiscalização por parte do dono de obra tem como fim principal impedir que o empreiteiro oculte vícios de difícil reparação no momento da entrega da obra. Desta forma, o dono de obra pode dirigir avisos mesmo quando a obra está em fase de execução de modo a evitar a sua conclusão em condições de não ser aceite o final (Gonçalves et al, 2020).

O processo de fiscalização ficou a cargo da empresa responsável pela manutenção do empreendimento EUROPORT. A relação entre as equipas instaladora e fiscalização nem

sempre revelou ser positiva uma vez que o edifício EUROPORT reporta a uma construção da década de 90 e a sua estrutura já não é a mais atual para serem desenvolvidos certos trabalhos de construção e aproveitamento de equipamentos já existentes. No entanto, com o decorrer dos trabalhos, as soluções mais viáveis, para os problemas encontrados, foram sendo apresentadas pela equipa da Casais Gibraltar no final ambas as partes ficaram satisfeitas.

3.2.3.5 Controlo de Qualidade

Os ensaios a executar com a totalidade da instalação e equipamentos a funcionar, permite verificar o funcionamento real dos sistemas de regulação e controlo permitindo verificar a adequação, em cadeia, de todos os componentes bem como o ajuste dos vários parâmetros de controlo. Adicionalmente, nesta fase, foram realizados ensaios de estanquicidade e de pressão como descrito seguidamente.

3.2.3.5.1 Ensaios de Estanquicidade

As redes de condutas foram submetidas a testes de resistência estrutural e estanquidade. Aqui, o caudal de fuga admitido deve ser inferior ao indicado no projeto estabelecido para a classe de estanquidade acordada com o Dono de obra.

Por se tratar de um trabalho desenvolvido num edifício com requisitos hospitalares, a classe mínima exigida foi a classe C de acordo com a norma EN 13779 – Requisitos de Ventilação e Ar Condicionado para edifícios não residenciais (Figura 39).

Airtightness class DIN EN 13779	Tightness class according to EUROVENT 2/2	Tightness class according to DIN 24194 part 2	Limit value for leakage flow rate (f _{max}) m ³ s ⁻¹ m ⁻²
A	A	II	$0.027 \times p_t^{0.65} \times 10^{-3}$
B	B	III	$0.009 \times p_t^{0.65} \times 10^{-3}$
C	C	IV	$0.003 \times p_t^{0.65} \times 10^{-3}$
D			$0.001 \times p_t^{0.65} \times 10^{-3}$

Figura 39 – Limites de resistência e estanquidade estabelecidos pela EN 13779
(Fonte: Manual do Equipamento WOHLER DP700).

Para a realização dos testes de estanquicidade foi utilizado o equipamento *Wohler DP700* (Figura 40) e o relatório de resultados obtidos encontra-se descrito na Figura 41.



Figura 40 – Equipamento utilizado na realização do ensaio de estanquicidade.

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CASAIS

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 T – (+350) 20045242 F – (+350) 20044478

Leakage test

Project

Customer name	CPCC
Customer number	3
Duct	SUPPLY DUCT

Wobler DP 700 1.04

Serial No.	1199
Calibration date	19/10/2018

Leakage test report of air ducts in accordance to EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date 15/02/2019

Measuring time 9:00

Presettings

Surface area	40 m²
Tightness class	D
Rate factor	1 l/(s.m²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	402 Pa
Leakage rate	0.2589 l/s
Duration	00:05:00 min

Result

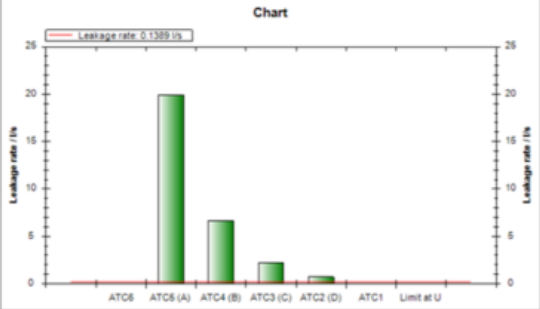
Test passed.

Remarks

Limits

ATC6	
ATC5 (A)	19.939 l/s
ATC4 (B)	6.6464 l/s
ATC3 (C)	2.2155 l/s
ATC2 (D)	0.7385 l/s
ATC1	
Limit at U	

Chart



Date 15/02/2019

Signature

Figura 41 - Relatório de Ensaio de teste de estanquidade.

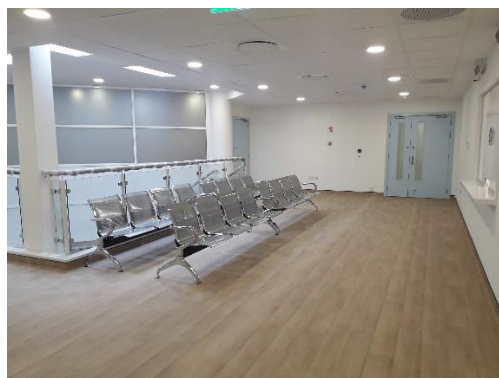
3.2.3.5.2 Testes de pressão

No decorrer dos trabalhos, foram realizados vários testes de pressão às redes de *Chilled Water* e *Heating*, de condensados e abastecimento de água. Os resultados obtidos encontram-se disponíveis no Manual de Manutenção elaborado e descrito no subcapítulo seguinte. O teste final de pressão foi realizado de acordo com as seguintes especificações (Tabela 8):

Tabela 8 – Parâmetros de qualidade para a realização dos testes de pressão.

	Características			
	Fluído de teste	Pressão de teste (bar)	Duração (h)	Margem máx. erro (%)
Ferro galvanizado	água	10,0	24	1
Rede de Condensados das unidades <i>Fan Coil</i>	água	6,0	0,25	1
Tubagens de Cobre das unidades de <i>Close Control</i>	nitrogénio	40,0	1	5

3.2.3.6 Registos fotográficos do final de obra



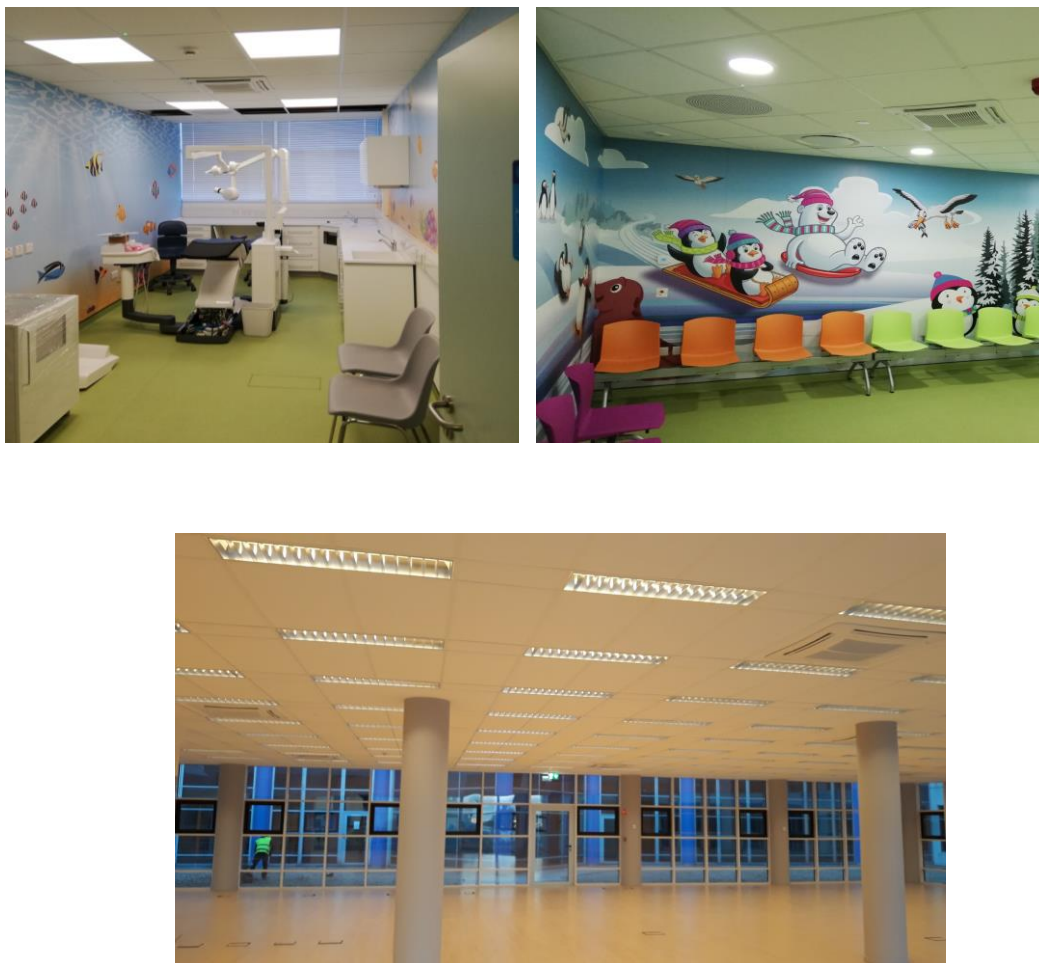


Figura 42 – Registo fotográfico de ambientes finais de alguns espaços das três fases de obra.

3.2.4 Manual de Operação e Manutenção – O&M Manual

Com a conclusão dos trabalhos surge a necessidade de reunir as informações relativas à operacionalidade do sistema num documento a ser entregue ao dono de obra.

A equipa responsável pela instalação dos equipamentos deve elaborar o manual onde conste o modo de operação de cada um deles e onde são descritos todos os conceitos fundamentais à interação técnico-equipamento. Para além disso, é necessário criar o plano de manutenção adequado aos sistemas, onde é descrito o procedimento de manutenção, a sua periodicidade e eventuais recomendações.

A localização geográfica do edifício e o tipo de água distribuída, requer a aplicação de medidas cuidadosas no que respeita ao processo de manutenção. Tratando-se de um território circundado maioritariamente por mar, o cuidado com as redes de águas salgadas deve ser constante e deve levar à tomada de uma consciência de manutenção

preventiva devido à permanência excessiva de aves e os ventos fortes que se sentem um pouco por todo o território. O *Operations & Maintenance* Manual (O&M) elaborado inclui informações como: telas finais, listagem e características técnicas dos equipamentos instalados, listagem de fornecedores, eventuais manuais de funcionamento, plano de manutenção simplificado e os relatórios de resultados efetuados aos materiais/instalações (Anexo 14).

3.2.4.1 Telas finais - “As Built”

Dando como terminados os trabalhos de construção civil, das especialidades e os ensaios a todos os equipamentos, foram realizadas as telas finais “*As Built*”, concebidas com o mesmo grau de especificação requerido para a elaboração do projeto e incluindo nesta fase todas as alterações que tenham sido introduzidas. Para além de todas as peças escritas e desenhadas correspondentes ao projeto, tal como executado, consideram-se parte integrante das telas finais os respetivos suportes informáticos.

3.2.4.2 Listagem de equipamentos e características técnicas

Esta listagem contém toda a informação relevante e correspondente a cada equipamento instalado: localização, dimensões, as potências e marca.

3.2.4.3 Listagem de fornecedores

São fornecidos, ao dono de obra, todos os contatos de fornecedores dos equipamentos instalados. Esta listagem é realizada com o objetivo de ajudar o cliente (dono de obra), ou a empresa responsável pela manutenção, na procura de peças de substituição e em caso de avaria, o pedido de assistência.

3.2.4.4 Manuais de Equipamentos

Cada equipamento adquirido vem acompanhado com toda a informação para a montagem, utilização e orientações de manutenção e esta informação é anexada ao manual O&M. Esta informação é de extrema importância tanto para o instalador como para o cliente, uma vez que seguidas e respeitadas todas as indicações desses manuais, podem ser mantidas as garantias do fabricante, sem exclusões.

3.2.4.5 Plano de Manutenção Simplificado

Este documento foi elaborado de forma a simplificar toda a informação de manutenção disponível nos manuais dos equipamentos.

Os objetivos da criação deste plano de manutenção são:

- Manter os equipamentos num estado de funcionamento seguro e eficiente;
- Manter a segurança das pessoas e bens preservando o ambiente;
- Minimizar custos totais com reparações;
- Prolongar a vida útil dos equipamentos.

Perante a localização do edifício, com o tipo de rede de águas existentes em Gibraltar e o ambiente agressivo, foram definidos cinco períodos de manutenção: Mensal (1), Trimestral (3), Semestral (6), Anual (12) e bienal (24). (Anexo 14)

3.2.4.6 Resultados de testes pressão

Os relatórios dos testes efetuados encontram-se disponíveis para consulta no O&M Manual. (Anexo 14)

3.3 Tarefas adicionais desenvolvidas

Decorreu o período de um ano durante as tarefas realizadas neste projeto e que foram descritas neste trabalho. Num ano, muita “água correu”. Os desafios encontrados durante este período foram muitos, mas o mais importante é dar os trabalhos como concluídos com os objetivos cumpridos, ainda que pelo meio a atenção possa ter sido desviada por outros fatores e/ou tarefas. A direção de obra das três fases descritas ao longo deste trabalho foi o principal foco da realização deste estágio. No entanto, durante este período, a metodologia de gestão aplicada a estas obras permitiu que fosse “alargada” a lista de obras a acompanhar. A Casais Gibraltar atravessou um período em que as adjudicações foram efetuadas em datas muito próximas e com exigência de períodos de execução curtos.

Assim, adicionalmente aos projetos do FSC, CPCC e PCC, foi realizado o acompanhamento de outras obras com dimensão consideravelmente inferior ainda que com necessidade de direção (AVAC e Hidráulica). Destacaram-se:

- Construção de um supermercado da cadeia “Eroski” – Implementação do sistema AVAC e instalação do sistema de abastecimento e drenagem de águas;
- Empreendimento “Kings Wharf Q27 – Trabalhos de substituição dos ramais de água salgada e água doce.
- *Jonh Snow House* – Trabalhos de ampliação e montagem de sistema de Climatização, abastecimento e drenagem de águas;
- Moradia nº 6, *St. Christopher’s Alley* – Construção, montagem de sistema de Climatização, abastecimento e drenagem de águas;

Como é possível constatar, pelo teor das tarefas descritas neste trabalho, a especialidade de AVAC foi parte capital destes 12 meses. No entanto, os trabalhos relacionados com a hidráulica estiveram sempre presentes e justificaram grande parte do tempo deste ano. A interação entre esta especialidade, o AVAC e a eletricidade revelou ser um desafio, dia após dia e as alterações ao projeto inicial da obra revelaram-se uma tarefa mais demorada do que o inicialmente previsto. Foi necessário fazer alterações de traçados ao projeto inicial uma vez que os traçados delineados pelo gabinete de projeto não continham inclinações de escoamento.

Ainda sobre obstáculos, na fase do CPCC, devido a problemas de escoamento das águas residuais foi necessária a implementação de bombas trituradores de drenagem.

3.4 Principais obstáculos

Em todos os trabalhos há obstáculos e este projeto não fugiu à regra.

Um dos obstáculos encontrados esteve relacionado com as características da água que circula em muitas das redes de Gibraltar. A utilização de água salgada como água residual é muito comum neste território e isto acarreta uma série de desvantagens tanto na fase de montagem como de requisitos de manutenção. Todos os materiais utilizados foram em PVC-U porque a água salgada provoca erosão nos metais, como por exemplo o latão e ferro.

A procura de novos fornecedores num país que não é o “nosso” também tem as suas particularidades. Foi necessária a pesquisa intensiva de novos fornecedores,

maioritariamente espanhóis, para a criação de uma lista que permitisse a comparação de preços, condições de pagamento e entrega. Com o tempo a passar, a confiança foi sendo cada vez maior, quer em termos de execução na comparação de preços, quer na relação empresa-fornecedor.

Durante a fase de orçamentação surgiram também algumas dúvidas, na medida em que nem sempre existia a certeza do valor de venda dos materiais. Foi necessário analisar os custos de estrutura e custo de MO para assim poder calcular a % a imputar nos materiais e MO.

CONCLUSÕES

4 CONCLUSÕES E PROPOSTAS DE TRABALHOS FUTUROS

4.1 CONCLUSÕES

Finalizado este projeto, chega a altura de referir quais as principais conclusões destes 12 meses de direção de obra.

Numa primeira fase, a adaptação ao mercado de Gibraltar, à cultura e aos princípios legais, que em tantos casos diferem do resto dos países da UE, correu melhor do que previsto.

Grande parte do conhecimento adquirido ao longo do mestrado foi aplicável, quer na área de preparação de obra, quer na execução e acompanhamento uma vez que ambas abrangem tarefas de natureza distinta. Uma mais relacionada com gestão e outra de cariz mais prático e de terreno.

As datas inicialmente previstas e acordadas com o Cliente para a entrega das três fases de obra foram cumpridas e o cliente ficou satisfeito com a apresentação do trabalho final. O desenvolvimento dos trabalhos correu “dentro e fora de horas”, mas sempre com o objetivo de acabar e a obra refletir um resultado de qualidade com uma relação custo-benefício bastante aceitável. Para isto fosse possível, foi necessária muita cooperação entre as equipas das várias especialidades envolvidas e um grupo composto por profissionais de excelência tanto de coordenação como de execução.

O proposto para desenvolvimento deste projeto era o de executar tarefas por ordem cronológica e todas elas com natureza distinta. A fase de análise de projeto revelou ser um grande desafio, mas se ao início parecia existir muita poeira, a relação final entre equipas de execução e projeto foi uma agradável surpresa ainda que sendo de empregadores distintos.

As sugestões e soluções apresentadas às equipas de projeto e de fiscalização (dono de obra) foram sempre discutidas de forma saudável e aceites na maior parte das vezes. Este fato revelou um resultado muito positivo, quer na satisfação do dono de obra quer para a Casais Gibraltar que conseguiu atingir o lucro pretendido.

Destacou-se o forte envolvimento de todos, nas três fases, comprovando-se que com uma boa equipa e uma boa gestão, os resultados positivos estão praticamente garantidos.

4.2 PROPOSTA DE TRABALHOS FUTUROS

Destacam-se, como propostas de trabalhos futuros:

- Estudo para possível substituição dos controladores das unidades Fan Coil implementadas nas fases 1 e 2 (FSC e CPCC) uma vez que são controladores descontinuados;
- Nas três fases de obra foram colocados registos de caudal de ar de abertura manual e em futuros trabalhos devem ser propostos registos de caudal de ar constante;
- Em próximos projetos devem ser evitadas as revisões sucessivas ao projeto uma vez que existe um grande desperdício de tempo para efetuar cada análise de cada alteração assim como possíveis custos antecipados e desnecessários;
- Estudo para instalação de *kits* hidráulicos aconselhados pelos fabricantes dos ventiloconvectores.

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5 BIBLIOGRAFIA E OUTRAS FONTES DE INFORMAÇÃO

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ANEXOS

6 ANEXOS

ANEXO I – Planta da fase 1: New Gibraltar Financial Services Centre (FSC)

ANEXO II – Planta da fase 2: New Children's Health Centre (CPCC)

ANEXO 3 – Planta da fase 3: New Primary Care Centre (PCC)

ANEXO IV – Projetos iniciais da fase 1, 2 e 3 (Gabinete de Projeto)

ANEXO V - Equipment and Specifications

ANEXO VI – Room Data sheets

ANEXO VII – The M&E Critical Specifications

ANEXO VIII – Orçamento Retificativo

ANEXO IX – Novos Layouts faz fases 1, 2 e 3 (Após correção do projeto)

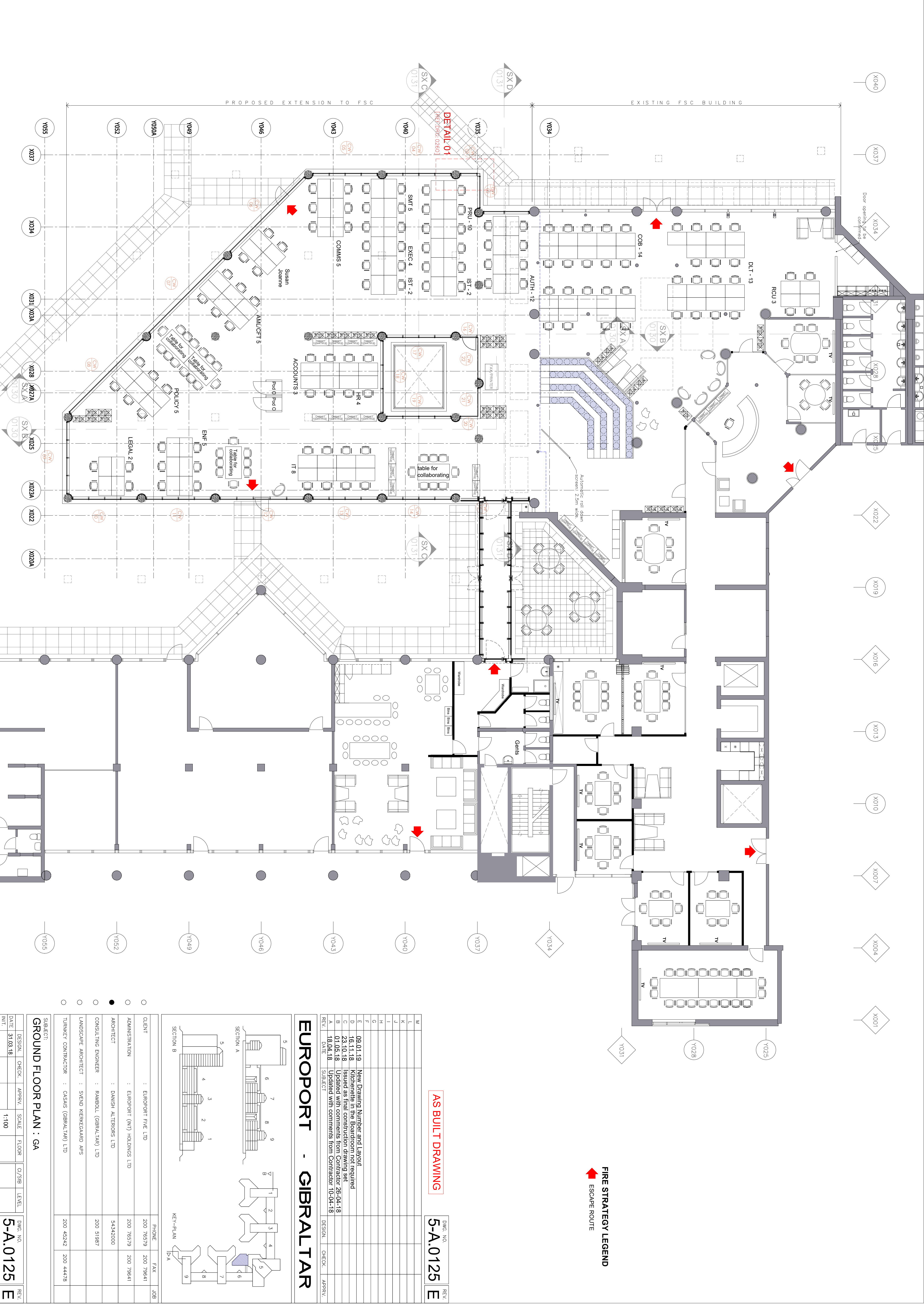
ANEXO X – Air Balance (Excel calculator)

ANEXO XI – Requisição Interna de Materiais e Equipamentos (RIM)

ANEXO XII – Ata de Reunião Semanal

ANEXO XIII – Auto de medição

ANEXO XIV - Operations and Maintenance – O&M Manual



AS BUILT DRAWING

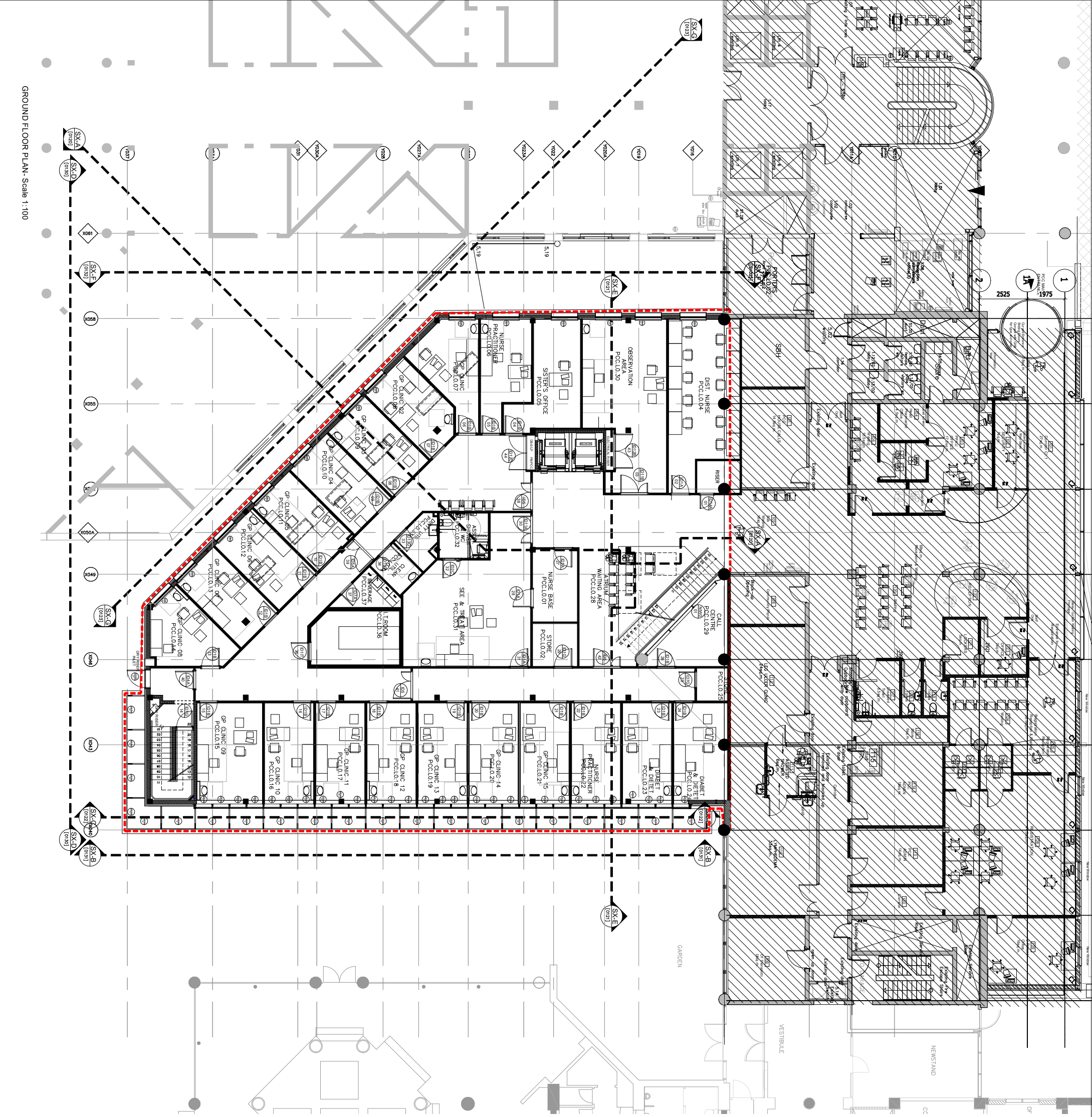
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FIRE STRATEGY LEGEND
ESCAPE ROUTE

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ADMINISTRATION	: EUROPORT (NI) HOLDINGS LTD	FAX	200 79641
ARCHITECT	: DANISH ALTERIORS LTD		
CONSULTING ENGINEER	: RAMBOLL (GIBRALTAR) LTD		
LANDSCAPE ARCHITECT	: SVEUD KIERKEGAARD APS		
TURNKEY CONTRACTOR	: CASAS (GIBRALTAR) LTD		

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I	2018.11.07	UTILITY STAIR			
H	2018.10.12	UPDATE DRAWING - IN BLUE CLOUD			
G	2018.07.26	NEW POSITION NEW ACCESS: ELECTRICAL RISER			
F	2018.05.22	LOCATION FOR APPROVAL. (ELEC. RISER, DB/IT, PB/PCC, DB/7/LP)			
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C	2018.03.14	FOR FULL PLANNING			
B	2018.03.02	FOR FULL PLANNING			
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EUROPORT - GIBRALTAR

SECTION A

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SECTION B

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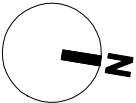
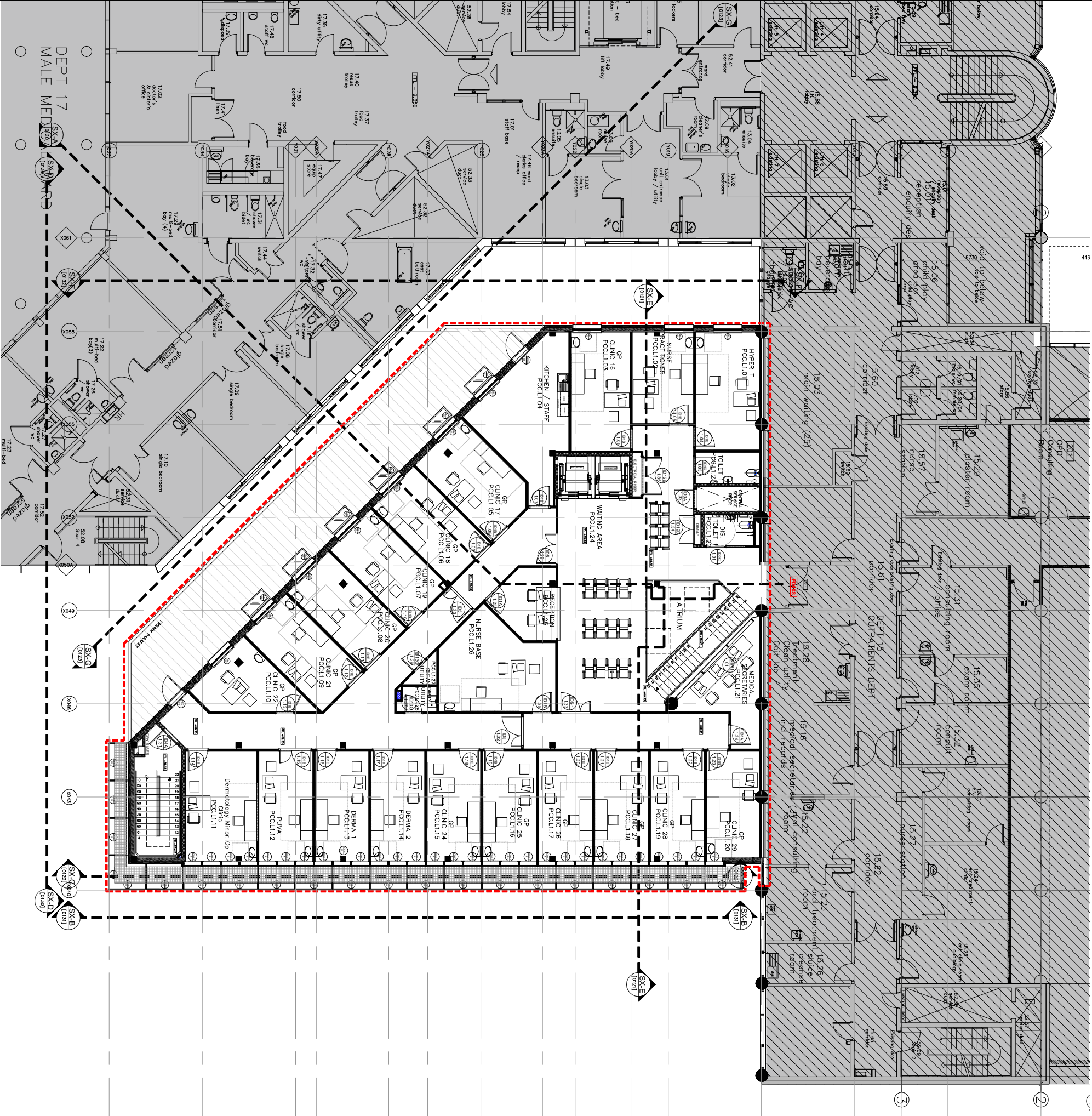
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ADMINISTRATION	: EUROPORT (INT) HOLDINGS LTD	PHONE	200 76579	FAX	200 79641	
ARCHITECT	: WSM ARCHITECTS LTD	PHONE	200 74547	FAX	200 79641	
CONSULTING ENGINEER	: RAMBOLL (GIBRALTAR) LTD	PHONE	200 51987	FAX	200 79641	
LANDSCAPE ARCHITECT	: SPEND KIERREGAARD APS	PHONE	200 45232	FAX	200 44478	
TURNKEY CONTRACTOR	: CASAS (GIBRALTAR) LTD	PHONE	200 45232	FAX	200 44478	

SUBJECT:

GROUND FLOOR PLAN

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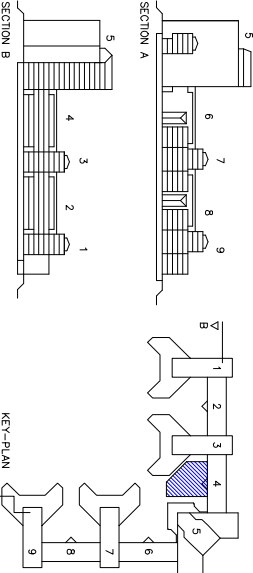
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J	2018.12.17	UPDATE DRAWING			
I	2018.12.06	UPDATE DRAWING			
H	2018.10.12	UPDATE DRAWING - IN BLUE CLOUD			
G	2018.08.02	NEW POSITION NEW ACCESS - ELECTRICAL RISER			
F	2018.07.28	LOCATION FOR APPROVAL (ELEC. RISER, DB/KITCHEN, DB/7/LP)			
E	2018.04.20	NEW DOOR REFERENCE			
D	2018.03.16/20	SKYLIGHT 1-07 REMOVED, NEW RWP			
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EUROPORT - GIBRALTAR

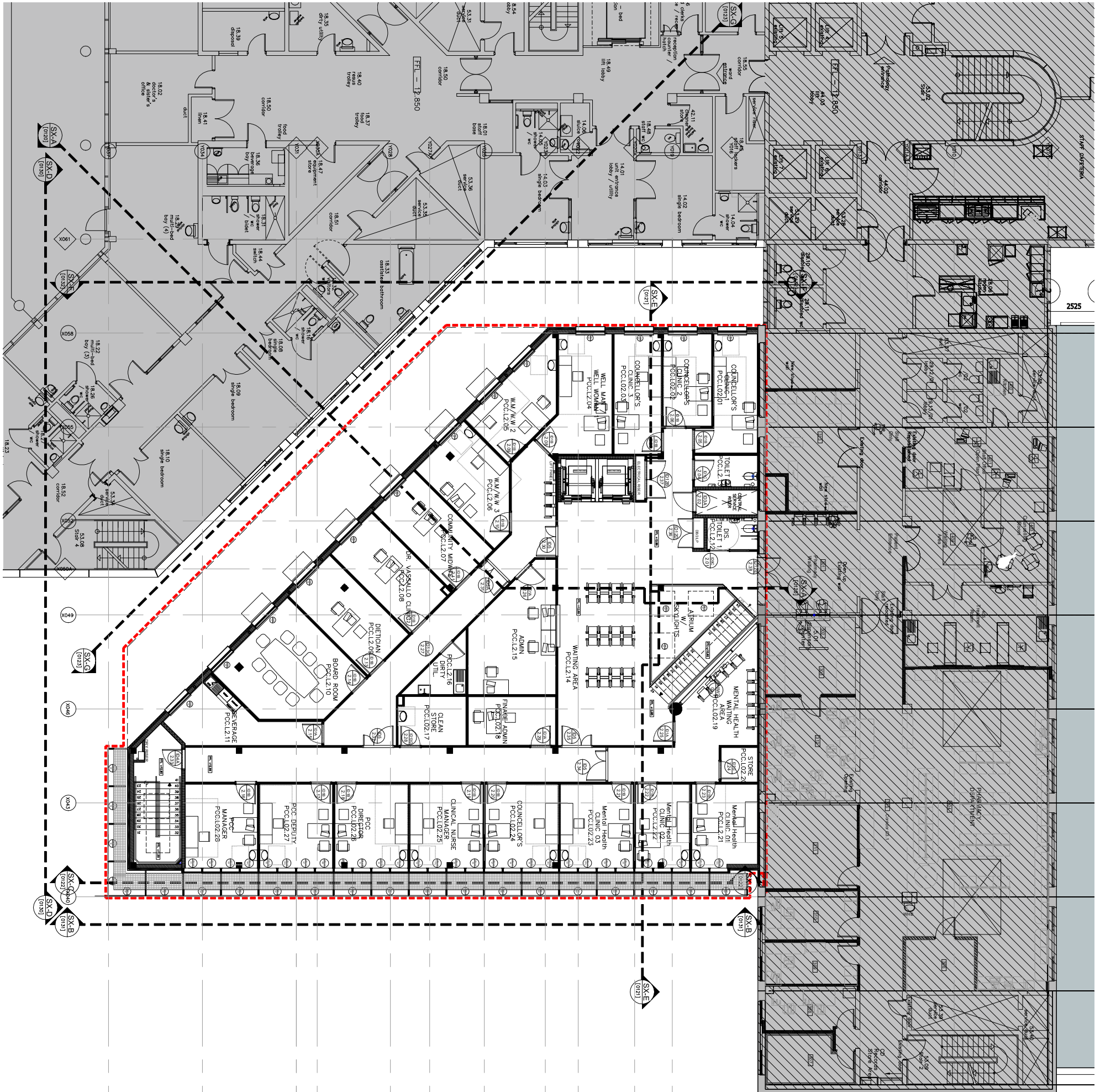
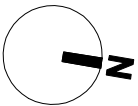


KEY-PLAN

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LANDSCAPE ARCHITECT	: SPEND KIERKEGAARD APS						
TURNKEY CONTRACTOR	: CASALS (GIBRALTAR) LTD		200 45252		200 44478		

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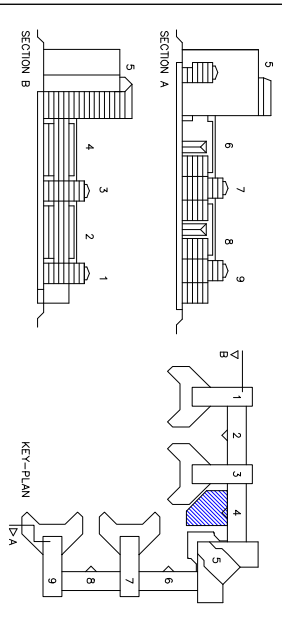
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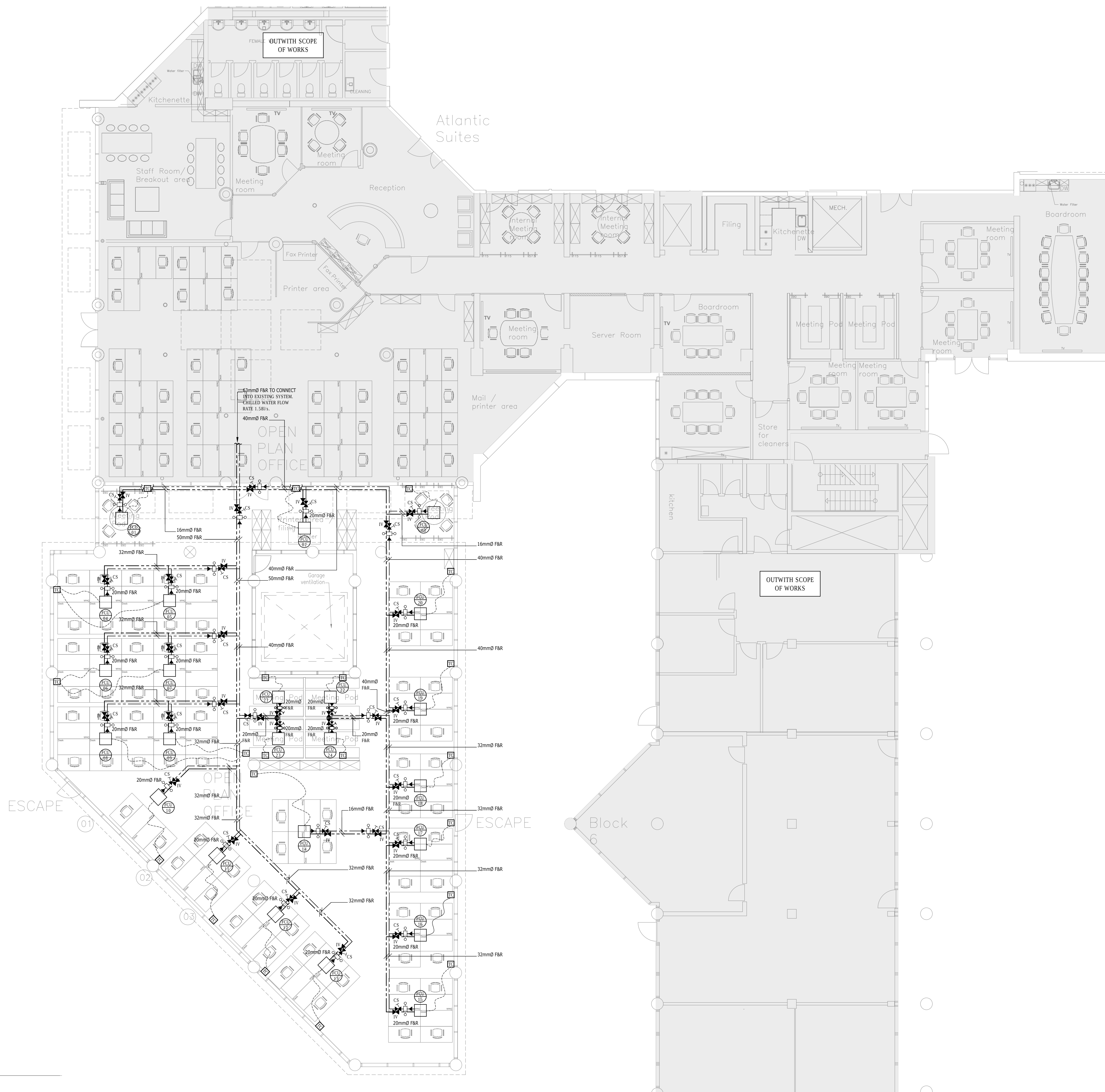
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H	2018.08.02	UPDATE DRAWING - IN BLUE CLOUD			
G	2018.05.22	NEW POSITION NEW ACCESS ELECTRICAL RISER			
F	2018.04.20	LOCATION FOR APPROVAL (ELEC. RISER, DB 2/1P)			
E	2018.04.20	NEW DOOR REFERENCE			
D	2018.03.16	FOR COMMENT			
C	2018.03.16	FOR COMMENT			
B	2018.03.02	FOR FULL PLANNING			
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EUROPORT - GIBRALTAR



CLIENT	: EUROPORT FIVE LTD	PHONE	200 76579	FAX	200 79641	JOB	
ADMINISTRATION	: EUROPORT (INT) HOLDINGS LTD		200 76579		200 79641		
ARCHITECT	: WSM ARCHITECTS LTD		200 74547				
CONSULTING ENGINEER	: RAMBOLL (GIBRALTAR) LTD		200 51987				
LANDSCAPE ARCHITECT	: SPEND KIERKEGAARD APS						
TURNKEY CONTRACTOR	: CASALS (GIBRALTAR) LTD		200 45252		200 44478		

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3. ALL LEVELS ARE IN METRES ABOVE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
5. AUTOMATIC CONTROLS BMS TO BE CARRIED OUT BY HONEYWELL.
6. LTWH PIPework SHALL BE TO BS5531-1:2006 AND SECURELY FIXED TO THE BUILDING STRUCTURE. CHW PIPework SHALL BE TO BS8553:1-1:2006.
7. AUTOMATIC AIR VENTS AND DRAIN COCKS TO BE PROVIDED AND INSTALLED AT LOW LEVEL POINTS RESPECTIVELY, TO ENABLE SYSTEM VENTING AND DRAINING.
8. ALL PLANT ITEMS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
9. THE CONTRACTOR SHALL FULLY CO-ORDINATE THE INSTALLATION WITH OTHER TRADES, FINAL FIRM AND BUILDING STRUCTURE.
10. CHW FLOW AND RETURN TEMPERATURES TO BE 6°C / 12°C ON FULL LOAD CONDITIONS.
11. ALL PIPework SHALL BE INSULATED WITH KINGSFAN KOOL THERM ZERO GPP ACCORDANCE WITH BS5422-2001. ALL INSULATION SHALL BE PAINTED WHITE.
12. FINAL POSITION OF TEMPERATURE CONTROLLER AND SENSORS TO BE AGREED WITH ARCHITECT.
13. PURPOSE BUILT ACCESS HATCHES TO BE PROVIDED TO ALL VALVES FOR PIPework MAINTENANCE.
14. CONTRACTOR TO ENSURE THAT ALL VALVES ARE COORDINATED WITH ALL OTHER SERVICES AS NOT TO OBSTRUCT FUTURE ACCESS.
15. THE CONTRACTOR TO ALLOW ISOLATION AND RECONNECTION OF EXISTING SYSTEM TO THE NEW EXTENSION.
16. IT IS ASSUMED THERE IS SUFFICIENT CAPACITY IN THE SYSTEM TO SATISFY THE NEW EXTENSION.

LEGEND:-

- | | |
|---|--------------------------|
|  | PIPEWORK IN CEILING VOID |
|  | FAN COIL UNIT |
|  | FAN COIL REFERENCE |
|  | COMMISSIONING SET |
|  | ISOLATION VALVE |
|  | TEMPERATURE CONTROLLER |

T01	TENDER ISSUE	MAR 2018	MK EQ	G
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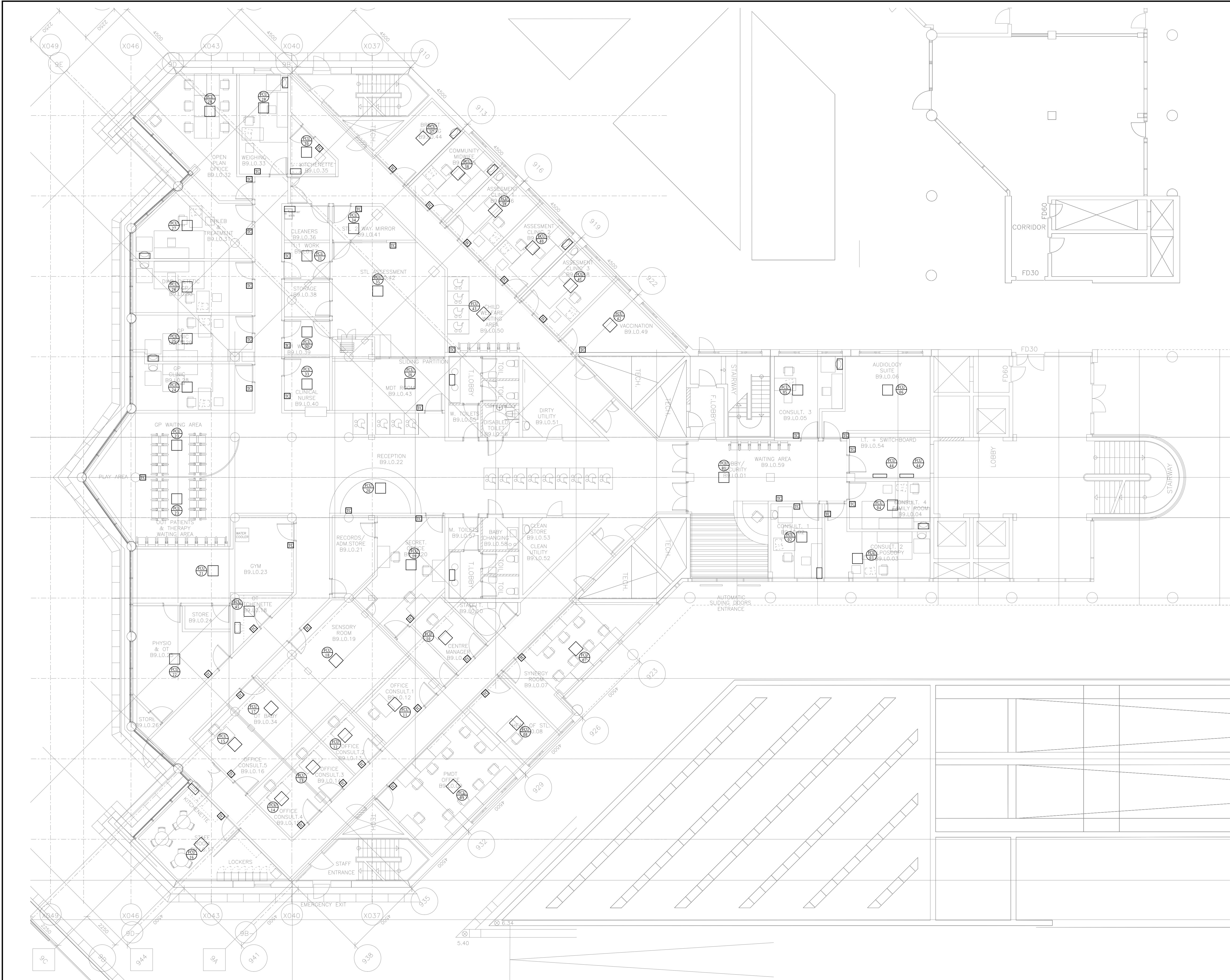
TENDER

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EXTENSION

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GROUND FLOOR CHILLED WATER LAYOUT

Project No: 310000176	Scale (@A1): 1:100	Drawn: MK	Date: MAR 20
Drawing No: RAM-FSC-00-DR-M-00300			Rev: T01



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 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - ALL HEATING IS PROPOSED TO BE VIA ELECTRIC COILS WITHIN FAN COIL UNITS. REFER TO EQUIPMENT SCHEDULES FOR FURTHER DETAILS.
 - THE LOCATION OF THE FAN COIL UNIT CONTROLLERS ARE INDICATIVE AND FINAL POSITIONS SHOULD BE AGREED WITH THE CLIENT AND ARCHITECT PRIOR TO INSTALLATION.

- LEGEND:-
- PIPEWORK IN CEILING VOID
 - FAN COIL UNIT
 - NEW FAN COIL UNIT REFERENCE
 - TEMPERATURE CONTROLLER
 - RISE TO ABOVE
 - DROP TO BELOW
 - DROP FROM ABOVE
 - EXISTING FAN COIL UNIT
 - EXISTING FAN COIL UNIT RELOCATED

T02	REVISED TENDER ISSUE	MAY 2018	MK EQ	GMC
T01	TENDER ISSUE	MAY 2018	MK EQ	GMC
Rev	Description	Date	By	App

TENDER

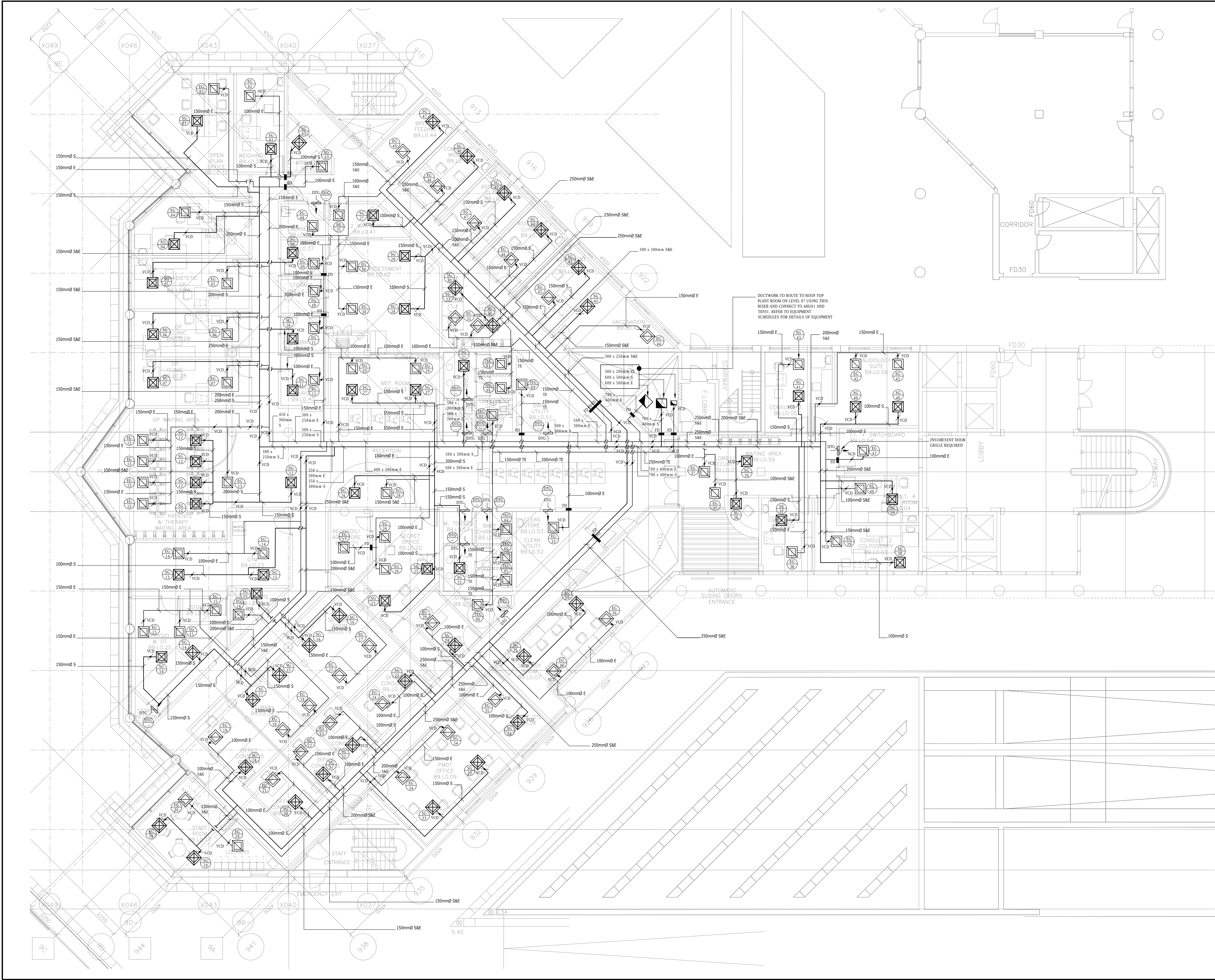
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GROUND FLOOR
HEATING (FAN COIL)
LAYOUT

Project No:	Scale (8A1):	Drawn:	Date:
310000176	1:100	MK	MAY 2018
Drawing No:	Rev:		
RAM-CPCC-00-DR-M-00200	T02		



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 - ALL DIMENSIONS ARE MILLIMETRES U.N.O.
 - ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - ALL VENTILATION INSTALLATIONS TO BE IN ACCORDANCE WITH THE PART F OF THE BUILDING REGULATIONS. IN ADDITION FOR NATURAL VENTILATION WITH BS 5925 AND CIBSE DESIGN GUIDE A, FOR MECHANICAL VENTILATION WITH BS 5720 AND CIBSE GUIDE B.
 - THE MECHANICAL VENTILATION INSTALLATION WILL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE HVAC SPECIFICATION DW144. ALL KITCHEN VENTILATION INSTALLATIONS WILL BE INSTALLED STRICTLY IN ACCORDANCE WITH HVAC SPECIFICATION DW172.
 - ALL EQUIPMENT WILL BE INSTALLED IN COMPLIANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
 - ALL DUCTWORK TO BE IDENTIFIED IN ACCORDANCE WITH BS1710.
 - ALL DUCTWORK SHALL BE MANUFACTURED, INSTALLED, TESTED AND COMMISSIONED IN STRICT ACCORDANCE WITH DW144, DW143, DW151, DW171, DW172, DW173, DW174 & CIBSE COMMISSIONING CODES.
 - ALL DUCTWORK PASSING THROUGH FIRE WALLS, FIRE BARRIERS OR FIRE RATED FLOORS WILL HAVE FIRE DAMPERS INSTALLED WITH A RATING MATCHING THAT OF THE BARRIER/FLOOR.
 - THE DUCTWORK SERVING THE KITCHEN EXTRACTION SYSTEM AND RISING TO ROOF LEVEL WILL BE FIRE RATED DUCT AND WILL HAVE FIRE RATED ACCESS DOORS AT EACH LEVEL ALLOWING INTERNAL CLEANING.
 - ID BANDS WILL BE FITTED ON ALL DUCTWORK AT A MINIMUM OF 3.0M CENTRES.
 - ALL SUPPLY AND EXTRACT DUCTWORK TO BE INSULATED (EXCLUDING TOILET EXTRACT SYSTEMS). REFER TO MEP SPECIFICATION FOR FULL DETAILS.
 - FLEXIBLE VENTILATION DUCTWORK SHALL ONLY BE USED FOR THE FINAL CONNECTIONS TO THE GRILLES. ALL EXCESS FLEXIBLE DUCTWORK SHALL BE CUT BACK TO A MINIMUM OF 500mm WHEN MAKING FINAL CONNECTIONS.
 - GRILLE TYPES TO BE FOUND IN MECHANICAL EQUIPMENT SCHEDULE. COLOURS TO BE SPECIFIED BY ARCHITECT.
 - DOOR TRANSFER GRILLES TYPE/DETAILS TO BE COORDINATED WITH ARCHITECT.
 - LOUVRES AND ROOF COWLS SHALL BE FITTED WITH BIRD MESHES AND ACCESS PANELS TO BE INSTALLED IN CONNECTING DUCTWORK TO ALLOW CLEANING. ALL LOUVRES SHALL BE SUITABLE FOR INTEGRATION INTO COMPOSITE ARCHITECTURAL PANELS - AS ARCHITECT'S SPECIFICATION. EXACT LOCATIONS TO BE AGREED WITH ARCHITECT.
 - ACCESS DOORS SHALL BE PROVIDED ADJACENT ALL FIRE DAMPERS, VOLUME CONTROL DAMPERS AND HEATER BATTERIES & EITHER SIDE OF AIR TURNS.
 - FINAL ROOF PLANT LAYOUT TO BE COORDINATED BY MAIN CONTRACTOR.
 - VENTILATION RATES HAVE BEEN SPECIFIED IN LINE WITH EUROPORT M&E CRITICAL SPECIFICATION DOCUMENT.

- LEGEND:-
- S SUPPLY DUCTWORK
 - E EXTRACT DUCTWORK
 - TE TOILET EXTRACT DUCTWORK
 - VCD VOLUME CONTROL DAMPER
 - SC SUPPLY DIFFUSER
 - EG EXTRACT GRILLE
 - EGC EXTRACT GRILLE CIRCULAR
 - DTG DOOR TRANSFER GRILLE
 - SC REF SUPPLY GRILLE REFERENCE
 - EG REF EXTRACT GRILLE REFERENCE
 - TEP TOILET EXTRACT FAN REFERENCE
 - DTG REF DOOR TRANSFER GRILLE REFERENCE

T02	REVISED TENDER ISSUE	MAY 2018	MK LN	GMC
T01	TENDER ISSUE	APR 2018	MK LN	GMC
Rev	Description	Date	By	App

TENDER

EUROPORT
EXTENSION

RAMBOLL

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GROUND FLOOR
VENTILATION
LAYOUT

Project No:
310000176

Scale (@A1):
1:100

Drawn:
MK

Date:
APR 2018

Drawing No:
RAM-CPCC-00-DR-M-00500

Rev:
T02

30/05/2018 16:14:40

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Notes

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- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- AUTOMATIC CONTROLS BMS TO BE CARRIED OUT BY HONEYWELL.
- AUTOMATIC AIR VENTS AND DRAIN COCKS TO BE PROVIDED AND INSTALLED AT HIGH AND LOW LEVEL POINTS RESPECTIVELY, TO ENABLE SYSTEM VENTING AND DRAINING.
- ALL PLANT ITEMS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- THE CONTRACTOR SHALL FULLY CO-ORDINATE THE INSTALLATION WITH OTHER TRADES, FINAL FRR AND BUILDING STRUCTURE.
- ALL PIPEWORK SHALL BE INSULATED WITH KAPLEX KKPLUS IN ACCORDANCE WITH BS5422:2001. ALL INSULATION SHALL BE PAINTED WHITE.
- FINAL POSITION OF TEMPERATURE CONTROLLER AND SENSORS TO BE AGREED WITH ARCHITECT.
- PURPOSE: BUILT ACCESS HATCHES SHALL BE PROVIDED TO ALL VALVES FOR FUTURE MAINTENANCE.
- CONTRACTOR TO ENSURE THAT ALL VALVES ARE COORDINATED WITH ALL OTHER SERVICES AS NOT TO OBSTRUCT FUTURE ACCESS.
- THE CONTRACTOR TO ALLOW ISOLATION AND RECONNECTION OF EXISTING SYSTEM TO THE NEW EXTENSION.
- IT IS ASSUMED THERE IS SUFFICIENT CAPACITY IN THE SYSTEM TO SATISFY THE NEW EXTENSION.
- APPROPRIATE VALVING TO BE ALLOWED FOR PROPOSED CONNECTION INTO EXISTING CW SYSTEM.
- ALL PIPEWORK CONNECTIONS BETWEEN DISSIMILAR MATERIALS TO UTILISE DIELECTRIC COUPLINGS WITH RUBBER RING GASKETS TO PREVENT PROCESS OF ELECTROLYSIS TAKING PLACE.

LEGEND:

- PIPEWORK IN CEILING VOID
- FAN COIL UNIT
- NEW FAN COIL UNIT REFERENCE
- COMMISSIONING SET
- ISOLATION VALVE
- TEMPERATURE CONTROLLER
- EXISTING FAN COIL UNIT
- EXISTING FAN COIL UNIT RELOCATED
- COPPER PIPEWORK
- GALVANISED STEEL PIPEWORK

ASSUMPTIONS:-
OPERATING TEMPERATURES: FLOW 7°C - RETURN 12°C
DIMENSIONING ΔPAT POINT OF SUPPLY = 1 BAR
DIMENSIONING COOLING CAPACITY BASED ON MEDIUM AIR SPEED / CAPACITY
DISTRIBUTION PIPEWORK WAS SIZED BASED ON MEDIUM AIR SPEED/CAPACITY
CONNECTING PIPEWORK WAS SIZED BASED ON MAXIMUM AIR SPEED/CAPACITY
ALL CHILLED WATER PIPEWORK MAIN RUNS WERE SIZED USING GALVANISED STEEL IN INCHES @ 300 Ap/i
CHILLED WATER PIPEWORK CONNECTIONS TO FCUs WERE SIZED USING COPPER IN mm @ 300 Ap/i
CONDENSATE PIPEWORK WAS SIZED USING PVC
CONDENSATE MAIN PIPEWORK DIMENSIONS WERE ASSUMED TO BE 63mm
CONDENSATE FCU CONNECTIONS WERE ASSUMED TO BE 40mm
ALL PIPEWORK SIZED ON THE ROOM COOLING REQUIREMENTS

T01	TENDER ISUUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	MK LN	GMC
Rev	Description	Date	By	App

RIBA STAGE 3

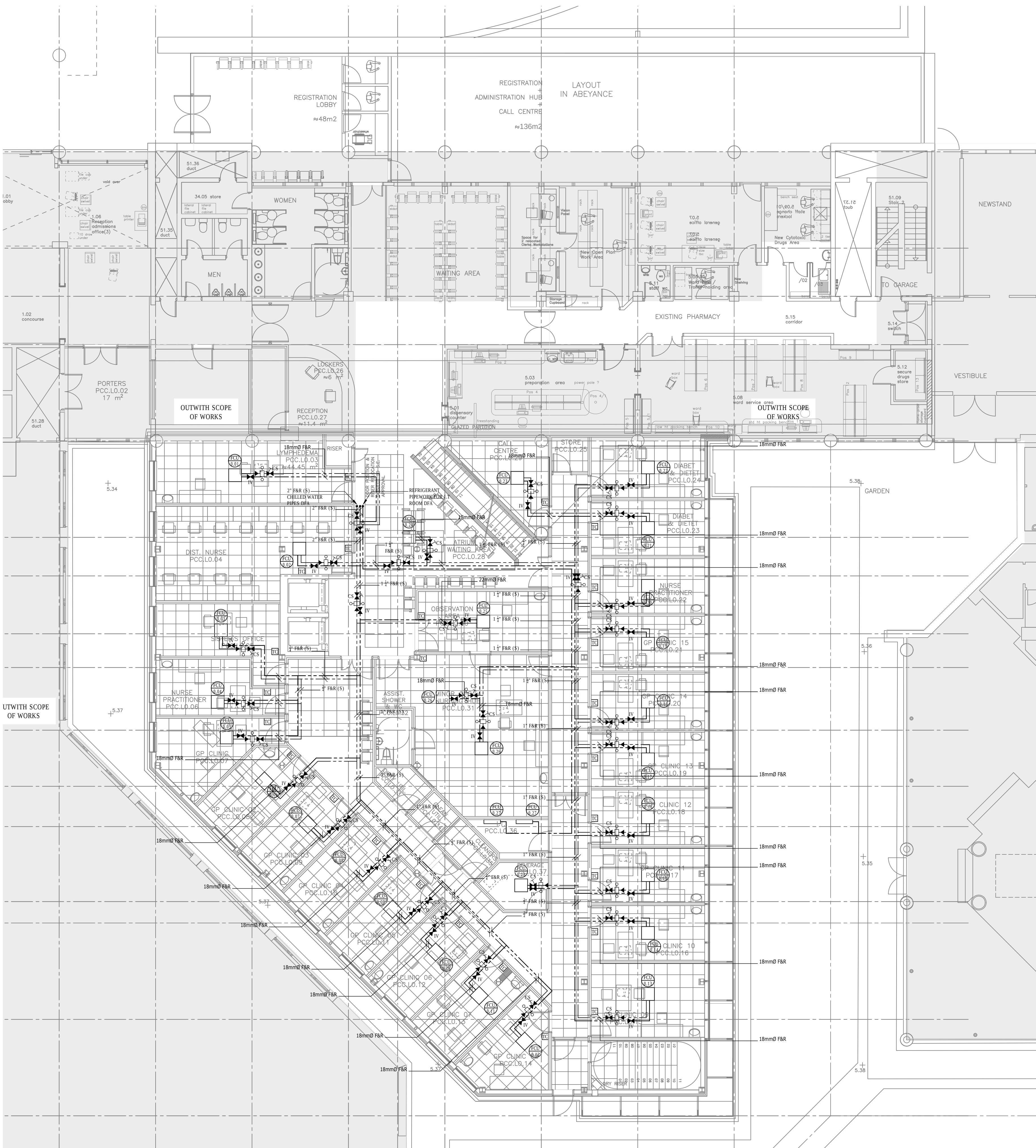
EUROPORT EXTENSION

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GROUND FLOOR CHILLED WATER LAYOUT

Project No:	Scale (@A1):	Drawn:	Date:
310000176	1:100	MK	DEC 2017
Drawing No:	Rev:		
RAM-PCC-00-DR-M-00300	T01		





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 - AUTOMATIC AIR VENTS AND DRAIN COCKS TO BE PROVIDED AND INSTALLED AT HIGH AND LOW LEVEL POINTS RESPECTIVELY, TO ENABLE SYSTEM VENTING AND DRAINING.
 - ALL PLANT ITEMS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
 - THE CONTRACTOR SHALL FULLY CO-ORDINATE THE INSTALLATION WITH OTHER TRADES, FINAL F&R AND BUILDING STRUCTURE.
 - ALL PIPEWORK SHALL BE INSULATED WITH KAPLEX KKPLUS IN ACCORDANCE WITH BS5422:2001. ALL INSULATION SHALL BE PAINTED WHITE.
 - FINAL POSITION OF TEMPERATURE CONTROLLER AND SENSORS TO BE AGREED WITH ARCHITECT.
 - PURPOSE: BUILT ACCESS HATCHES SHALL BE PROVIDED TO ALL VALVES FOR FUTURE MAINTENANCE.
 - CONTRACTOR TO ENSURE THAT ALL VALVES ARE COORDINATED WITH ALL OTHER SERVICES AS NOT TO OBSTRUCT FUTURE ACCESS.
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 - IT IS ASSUMED THERE IS SUFFICIENT CAPACITY IN THE SYSTEM TO SATISFY THE NEW EXTENSION.
 - APPROPRIATE VALVING TO BE ALLOWED FOR PROPOSED CONNECTION INTO EXISTING CW SYSTEM.
 - ALL PIPEWORK CONNECTIONS BETWEEN DISSIMILAR MATERIALS TO UTILISE DIELECTRIC COUPLINGS WITH RUBBER RING GASKETS TO PREVENT PROCESS OF ELECTROLYSIS TAKING PLACE.

LEGEND:

- PIPEWORK IN CEILING VOID
- FAN COIL UNIT
- NEW FAN COIL UNIT REFERENCE
- COMMISSIONING SET
- ISOLATION VALVE
- TEMPERATURE CONTROLLER
- EXISTING FAN COIL UNIT
- EXISTING FAN COIL UNIT RELOCATED
- COPPER PIPEWORK
- GALVANISED STEEL PIPEWORK

ASSUMPTIONS:-
OPERATING TEMPERATURES: FLOW 7°C - RETURN 12°C
DIMENSIONING ΔPAT POINT OF SUPPLY = 1 BAR
DIMENSIONING COOLING CAPACITY BASED ON MEDIUM AIR SPEED / CAPACITY
DISTRIBUTION PIPEWORK WAS SIZED BASED ON MEDIUM AIR SPEED/CAPACITY
CONNECTING PIPEWORK WAS SIZED BASED ON MAXIMUM AIR SPEED/CAPACITY
ALL CHILLED WATER PIPEWORK MAIN RUNS WERE SIZED USING GALVANISED STEEL IN INCHES @ 300 Ap/i
CHILLED WATER PIPEWORK CONNECTIONS TO FCUS WERE SIZED USING COPPER IN mm @ 300 Ap/i
CONDENSATE PIPEWORK WAS SIZED USING PVC
CONDENSATE MAIN PIPEWORK DIMENSIONS WERE ASSUMED TO BE 63mm
CONDENSATE FCU CONNECTIONS WERE ASSUMED TO BE 40mm
ALL PIPEWORK SIZED ON THE ROOM COOLING REQUIREMENTS

T01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	MK IN	GMC
Rev	Description	Date	By Chk	App

TENDER

EUROPORT
EXTENSION

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FIRST FLOOR
CHILLED WATER
LAYOUT

Project No:	Scale (@A1):	Drawn:	Date:
310000176	1:100	MK	DEC 2017
Drawing No:	Rev:		
RAM-PCC-01-DR-M-00301	T01		



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 - THE CONTRACTOR SHALL FULLY CO-ORDINATE THE INSTALLATION WITH OTHER TRADES, FINAL FRR AND BUILDING STRUCTURE.
 - ALL PIPEWORK SHALL BE INSULATED WITH KAIFLEX KKPLUS IN ACCORDANCE WITH BS5422:2001. ALL INSULATION SHALL BE PAINTED WHITE.
 - FINAL POSITION OF TEMPERATURE CONTROLLER AND SENSORS TO BE AGREED WITH ARCHITECT.
 - PURPOSE: BUILT ACCESS HATCHES SHALL BE PROVIDED TO ALL VALVES FOR FUTURE MAINTENANCE.
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 - ALL PIPEWORK CONNECTIONS BETWEEN DISSIMILAR MATERIALS TO UTILISE DIELECTRIC COUPLINGS WITH RUBBER RING GASKETS TO PREVENT PROCESS OF ELECTROLYSIS TAKING PLACE.

- LEGEND:
- PIPEWORK IN CEILING VOID
 - FAN COIL UNIT
 - NEW FAN COIL UNIT REFERENCE
 - CS COMMISSIONING SET
 - IV ISOLATION VALVE
 - TC TEMPERATURE CONTROLLER
 - EX EXISTING FAN COIL UNIT
 - RE EXISTING FAN COIL UNIT RELOCATED
 - (C) COPPER PIPEWORK
 - (S) GALVANISED STEEL PIPEWORK

- ASSUMPTIONS:-
- OPERATING TEMPERATURES: FLOW 7°C - RETURN 12°C
 - DIMENSIONING ΔPAT POINT OF SUPPLY = 1 BAR
 - DIMENSIONING COOLING CAPACITY BASED ON MEDIUM AIR SPEED / CAPACITY
 - DISTRIBUTION PIPEWORK WAS SIZED BASED ON MEDIUM AIR SPEED/CAPACITY
 - CONNECTING PIPEWORK WAS SIZED BASED ON MAXIMUM AIR SPEED/CAPACITY
 - ALL CHILLED WATER PIPEWORK MAIN RUNS WERE SIZED USING GALVANISED STEEL IN INCHES @ 300 Ap/i
 - CHILLED WATER PIPEWORK CONNECTIONS TO FCUS WERE SIZED USING COPPER IN mm @ 300 Ap/i
 - CONDENSATE PIPEWORK WAS SIZED USING PVC
 - CONDENSATE MAIN PIPEWORK DIMENSIONS WERE ASSUMED TO BE 63mm
 - CONDENSATE FCU CONNECTIONS WERE ASSUMED TO BE 40mm
 - ALL PIPEWORK SIZED ON THE ROOM COOLING REQUIREMENTS

T01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	MK IN	GMC
Rev	Description	Date	By Chk	App

TENDER

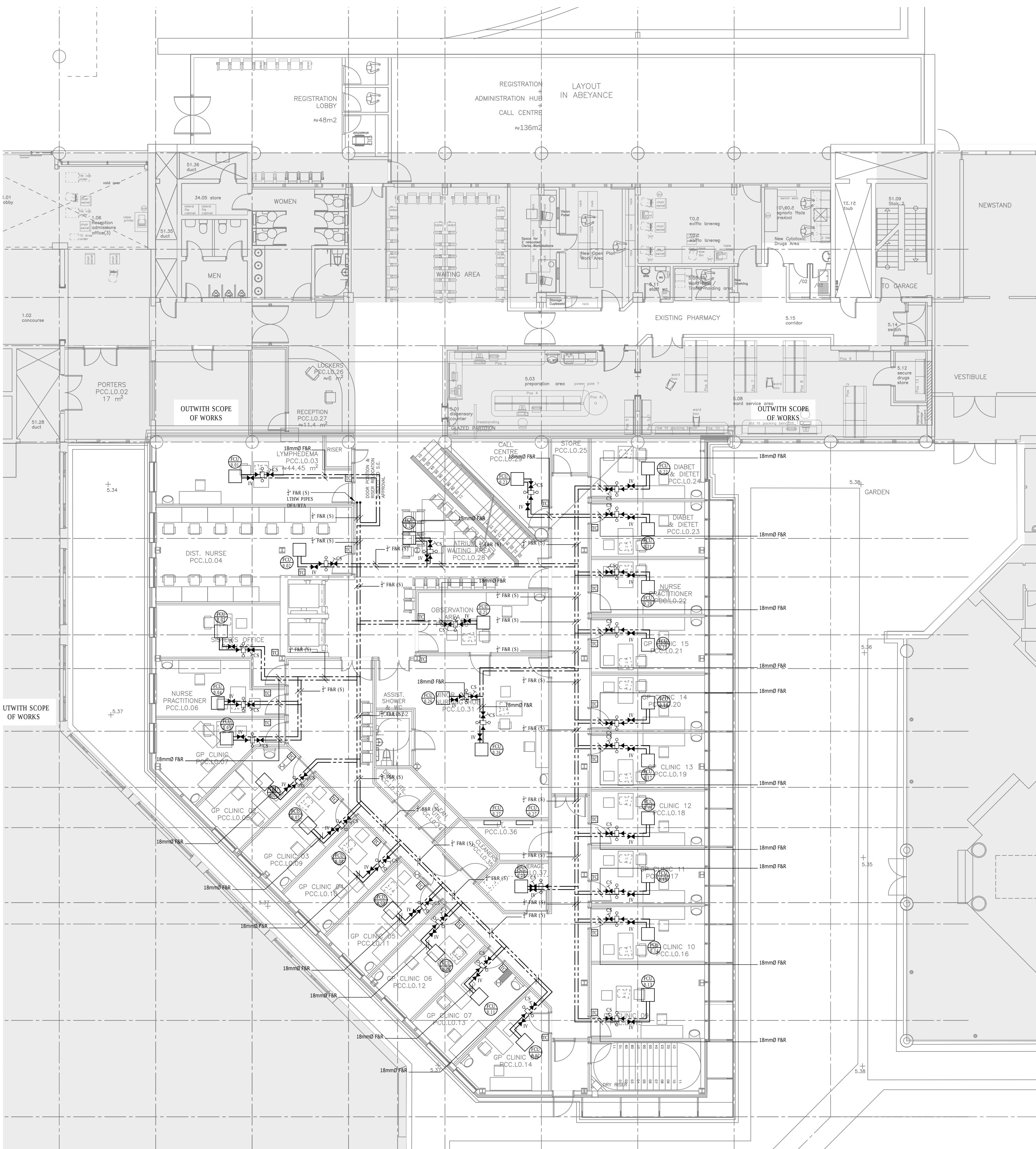
EUROPORT
EXTENSION

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SECOND FLOOR
CHILLED WATER
LAYOUT

Project No:	Scale (@A1):	Drawn:	Date:
310000176	1:100	MK	DEC 2017
Drawing No:	Rev:		
RAM-PCC-02-DR-M-00302	T01		



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 - ALL MAIN BRANCHES SHALL INCORPORATE COMMISSIONING SETS, DRV'S, IV'S AND LSV'S TO FACILITATE BALANCING IN ACCORDANCE WITH CIBSE CODES, AND IN ACCORDANCE WITH GOOD PRACTICE.
 - THE MECHANICAL CONTRACTOR SHALL ALLOW ALL NECESSARY ANCILLARIES & SYSTEMS IN ORDER TO DEAL WITH THERMAL EXPANSION /CONTRACTION.
 - THE CONTRACTOR SHALL ALLOW FOR ALL PIPED SERVICES ROUTED WITHIN UNHEATED AREAS TO BE TRACE HEATED AGAINST FROST DAMAGE.
 - ALL SERVICES WILL BE IDENTIFIED IN ACCORDANCE WITH BS 1710 AND GOOD ENGINEERING PRACTICE. PIPEWORK TO BE RAL 6003.
 - ALL PIPEWORK TO BE PRESSURE TESTED PRIOR TO APPLICATION OF INSULATION.
 - ALL STEEL PIPEWORK ABOVE 65MM TO HAVE TWO COATS OF RED OXIDE PAINT AFTER PRESSURE TESTING AND PRIOR TO APPLYING INSULATION.
 - ALL PIPEWORK IN PLANT-ROOMS, RISERS, RECESSES, BOXING-IN OR CEILING VOIDS SHALL BE THERMALLY INSULATED THROUGHOUT USING THE MATERIALS IN ACCORDANCE WITH THE M&E SPECIFICATION.
 - ALL PLANT ITEMS SHALL BE COMPLETE WITH ISOLATING VALVES & DRAIN COCKS ALLOWING ITEMS TO BE DRAINED, DISCONNECTED OR REMOVED FOR SERVICING & REPLACEMENT.
 - ALL VERTICAL PIPE RISERS & MAIN ZONES SHALL BE COMPLETE WITH ISOLATING VALVES & DRAIN COCKS INSTALLED IN ACCESSIBLE LOCATIONS ALLOWING SECTIONS TO BE ISOLATED FOR FUTURE ALTERATIONS, ETC.
 - DRAIN COCKS (DCV) SHALL BE PROVIDED TO ALL LOW POINTS ON THE SYSTEM AND AUTOMATIC AIR VENTS (AAV) SHALL BE PROVIDED TO ALL HIGH POINTS ON THE SYSTEM.
 - ISOLATION VALVES (IV) SHALL BE PROVIDED TO ALL MAIN BRANCHES THROUGHOUT THE SYSTEM.
 - IDENTITY BANDS SHALL BE FITTED ON ALL SECTIONS OF LTHW PIPEWORK AT A MINIMUM OF 3M CENTRES. ALL VALVES, COCKS, VENTS, ETC. SHALL BE LABELLED WITH A UNIQUE ENGRAVED TRAFFOLITE IDENTITY TAG.
 - ALL MAIN BRANCHES SHALL INCORPORATE COMMISSIONING SETS, DRV'S, IV'S AND LSV'S TO FACILITATE BALANCING IN ACCORDANCE WITH CIBSE CODES, AND IN ACCORDANCE WITH GOOD PRACTICE.
 - HEATING FLOW AND RETURN TEMPERATURES FROM EXISTING SYSTEM HAVE BEEN SIZED ON 81°C/61°C
 - MAIN PIPEWORK RUNS HAVE BEEN SIZED IN STEEL. FINAL CONNECTION PIPEWORK TO FCU'S HAVE BEEN SIZED IN COPPER.
 - FIRE COLLARS TO BE PROVIDED TO PIPEWORK AS IT PASSES THROUGH FIRE COMPARTMENTS.
 - ALL PIPEWORK SHALL BE INSULATED WITH KAPLEX KKP105 IN ACCORDANCE WITH BS5422:2001. ALL INSULATION SHALL BE PAINTED WHITE.
 - LTHW PIPE SIZES HAVE BEEN CALCULATED BASED ON THE ROOM'S HEAT LOSS.
 - CONTRACTOR RESPONSIBLE FOR INTEGRATION TO THE EXISTING SYSTEM.

LEGEND:-

- PIPEWORK IN CEILING VOID
- FAN COIL UNIT
- FAN COIL REFERENCE
- ISOLATING VALVE
- COMMISSIONING SET
- TEMPERATURE CONTROLLER
- RTA RISE TO ABOVE
- DTB DROP TO BELOW
- DFA DROP FROM ABOVE

T01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	NOV 2017	NH IN	GMC
Rev	Description	Date	By	App

RIBA STAGE 3

EUROPORT
EXTENSION



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GROUND FLOOR
HEATING
LAYOUT

Project No:	Scale (1@1):	Drawn:	Date:
310000176	1:100	NH	NOV 2017
Drawing No:	Rev:		
RAM-PCC-00-DR-M-00200	T01		



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 - THE MECHANICAL CONTRACTOR SHALL ALLOW ALL NECESSARY ANCILLARIES & SYSTEMS IN ORDER TO DEAL WITH THERMAL EXPANSION / CONTRACTION.
 - THE CONTRACTOR SHALL ALLOW FOR ALL PIPED SERVICES ROUTED WITHIN UNHEATED AREAS TO BE TRACE HEATED AGAINST FROST DAMAGE.
 - ALL SERVICES WILL BE IDENTIFIED IN ACCORDANCE WITH BS 1710 AND GOOD ENGINEERING PRACTICE. PIPEWORK TO BE RAL 6003.
 - ALL PIPEWORK TO BE PRESSURE TESTED PRIOR TO APPLICATION OF INSULATION.
 - ALL STEEL PIPEWORK ABOVE 65MM TO HAVE TWO COATS OF RED OXIDE PAINT AFTER PRESSURE TESTING AND PRIOR TO APPLYING INSULATION.
 - ALL PIPEWORK IN PLANT ROOMS, RISERS, RECESSES, BOXING-IN OR CEILING VOIDS SHALL BE THERMALLY INSULATED THROUGHOUT USING THE MATERIALS IN ACCORDANCE WITH THE M&E SPECIFICATION.
 - ALL PLANT ITEMS SHALL BE COMPLETE WITH ISOLATING VALVES & DRAIN COCKS ALLOWING ITEMS TO BE DRAINED, DISCONNECTED OR REMOVED FOR SERVICING & REPLACEMENT.
 - ALL VERTICAL PIPE RISERS & MAIN ZONES SHALL BE COMPLETE WITH ISOLATING VALVES & DRAIN COCKS INSTALLED IN ACCESSIBLE LOCATIONS ALLOWING SECTIONS TO BE ISOLATED FOR FUTURE ALTERATIONS, ETC.
 - DRAIN COCKS (DCV) SHALL BE PROVIDED TO ALL LOW POINTS ON THE SYSTEM AND AUTOMATIC AIR VENTS (AAV) SHALL BE PROVIDED TO ALL HIGH POINTS ON THE SYSTEM.
 - ISOLATION VALVES (IV) SHALL BE PROVIDED TO ALL MAIN BRANCHES THROUGHOUT THE SYSTEM.
 - IDENTITY BANDS SHALL BE FITTED ON ALL SECTIONS OF LTHW PIPEWORK AT A MINIMUM OF 3M CENTRES. ALL VALVES, COCKS, VENTS, ETC. SHALL BE LABELLED WITH A UNIQUE ENGRAVED TRAFFOLITE IDENTITY TAG.
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 - FIRE COLLARS TO BE PROVIDED TO PIPEWORK AS IT PASSES THROUGH FIRE COMPARTMENTS.
 - ALL PIPEWORK SHALL BE INSULATED WITH KATLEX KKP105 IN ACCORDANCE WITH BS5422:2001. ALL INSULATION SHALL BE PAINTED WHITE.
 - LTHW PIPE SIZES HAVE BEEN CALCULATED BASED ON THE ROOM'S HEAT LOSS.
 - CONTRACTOR RESPONSIBLE FOR INTEGRATION TO THE EXISTING SYSTEM.

LEGEND:-

- PIPEWORK IN CEILING VOID
- FAN COIL UNIT
- FAN COIL REFERENCE
- ISOLATING VALVE
- COMMISSIONING SET
- TEMPERATURE CONTROLLER
- RTA
- RISE TO ABOVE
- DTB
- DFA
- DROP FROM ABOVE

T01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	NH IN	GMC
Rev	Description	Date	By	App

RIBA STAGE 3

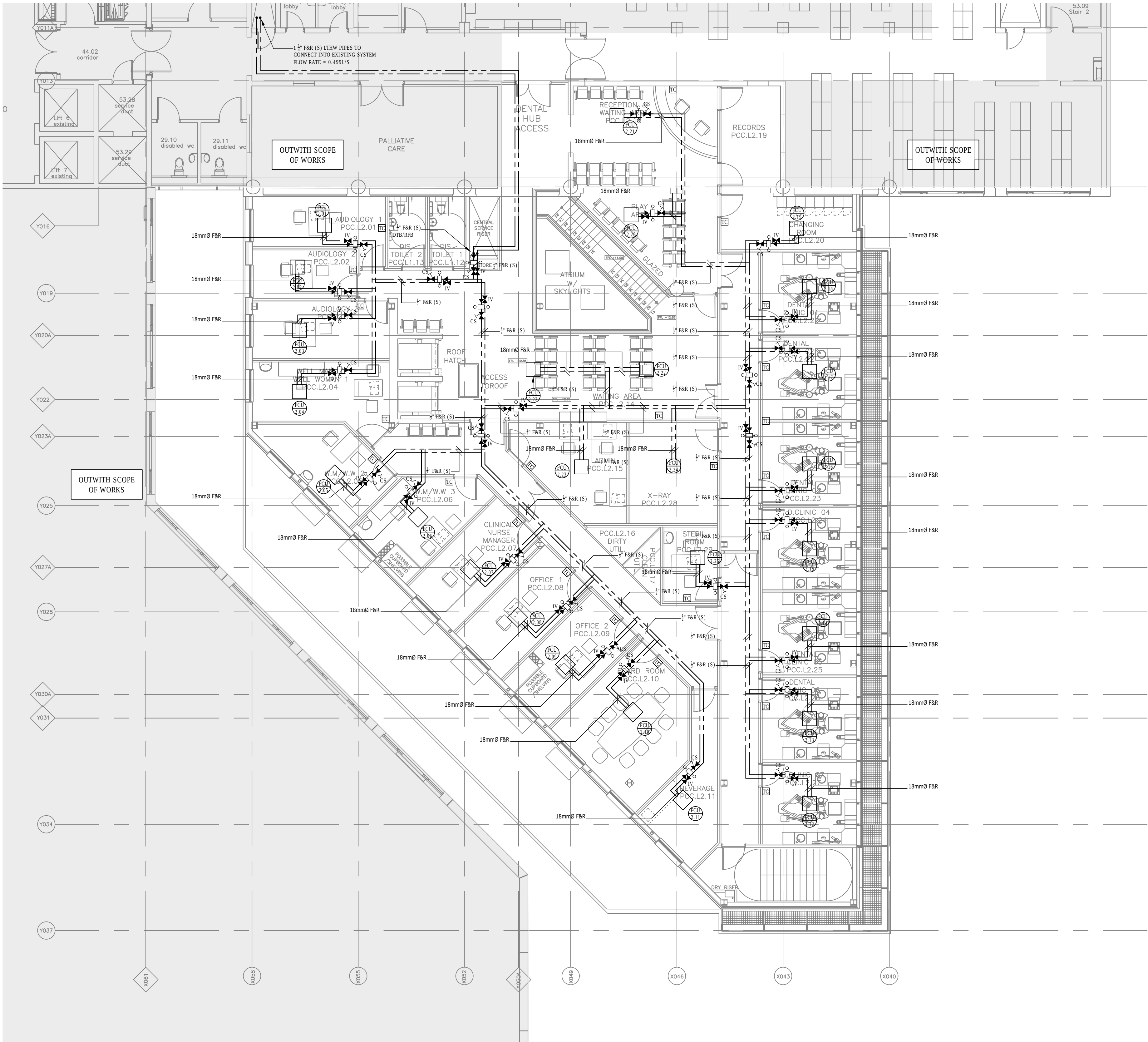
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FIRST FLOOR
HEATING
LAYOUT

Project No:	Scale (8A1):	Drawn:	Date:
310000176	1:100	NH	DEC 2017
Drawing No:	Rev:		
RAM-PCC-01-DR-M-00201	T01		



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 - THE CONTRACTOR SHALL ALLOW FOR ALL PIPED SERVICES ROUTED WITHIN UNHEATED AREAS TO BE TRACE HEATED AGAINST FROST DAMAGE.
 - ALL SERVICES WILL BE IDENTIFIED IN ACCORDANCE WITH BS 1710 AND GOOD ENGINEERING PRACTICE. PIPEWORK TO BE RAL 6003.
 - ALL PIPEWORK TO BE PRESSURE TESTED PRIOR TO APPLICATION OF INSULATION.
 - ALL STEEL PIPEWORK ABOVE 65MM TO HAVE TWO COATS OF RED OXIDE PAINT AFTER PRESSURE TESTING AND PRIOR TO APPLYING INSULATION.
 - ALL PIPEWORK IN PLANT-ROOMS, RISERS, RECESSES, BOXING-IN OR CEILING VOIDS SHALL BE THERMALLY INSULATED THROUGHOUT USING THE MATERIALS IN ACCORDANCE WITH THE M&E SPECIFICATION.
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 - ISOLATION VALVES (IV) SHALL BE PROVIDED TO ALL MAIN BRANCHES THROUGHOUT THE SYSTEM.
 - IDENTITY BANDS SHALL BE FITTED ON ALL SECTIONS OF LTHW PIPEWORK AT A MINIMUM OF 3M CENTRES. ALL VALVES, COCKS, VENTS, ETC. SHALL BE LABELLED WITH A UNIQUE ENGRAVED TRAFFOLYTE IDENTITY TAG.
 - ALL MAIN BRANCHES SHALL INCORPORATE COMMISSIONING SETS, DRV'S, IV'S AND LSV'S TO FACILITATE BALANCING IN ACCORDANCE WITH CIBSE CODES, AND IN ACCORDANCE WITH GOOD PRACTICE.
 - HEATING FLOW AND RETURN TEMPERATURES FROM EXISTING SYSTEM HAVE BEEN SIZED ON 81°C/61°C
 - MAIN PIPEWORK RUNS HAVE BEEN SIZED IN STEEL. FINAL CONNECTION PIPEWORK TO FCU'S HAVE BEEN SIZED IN COOPER.
 - FIRE COLLARS TO BE PROVIDED TO PIPEWORK AS IT PASSES THROUGH FIRE COMPARTMENTS.
 - ALL PIPEWORK SHALL BE INSULATED WITH KAPLEX KKKPLUS IN ACCORDANCE WITH BS5422:2001. ALL INSULATION SHALL BE PAINTED WHITE.
 - LTHW PIPE SIZES HAVE BEEN CALCULATED BASED ON THE ROOM'S HEAT LOSS.
 - CONTRACTOR RESPONSIBLE FOR INTEGRATION TO THE EXISTING SYSTEM.

- LEGEND:-
- PIPEWORK IN CEILING VOID
 - FAN COIL UNIT
 - FAN COIL REFERENCE
 - ISOLATING VALVE
 - COMMISSIONING SET
 - TEMPERATURE CONTROLLER
 - RTA
 - RISE TO ABOVE
 - DTB
 - DFA
 - DROP FROM ABOVE

T01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	MK LN	GMC
Rev	Description	Date	By Chk	App

TENDER

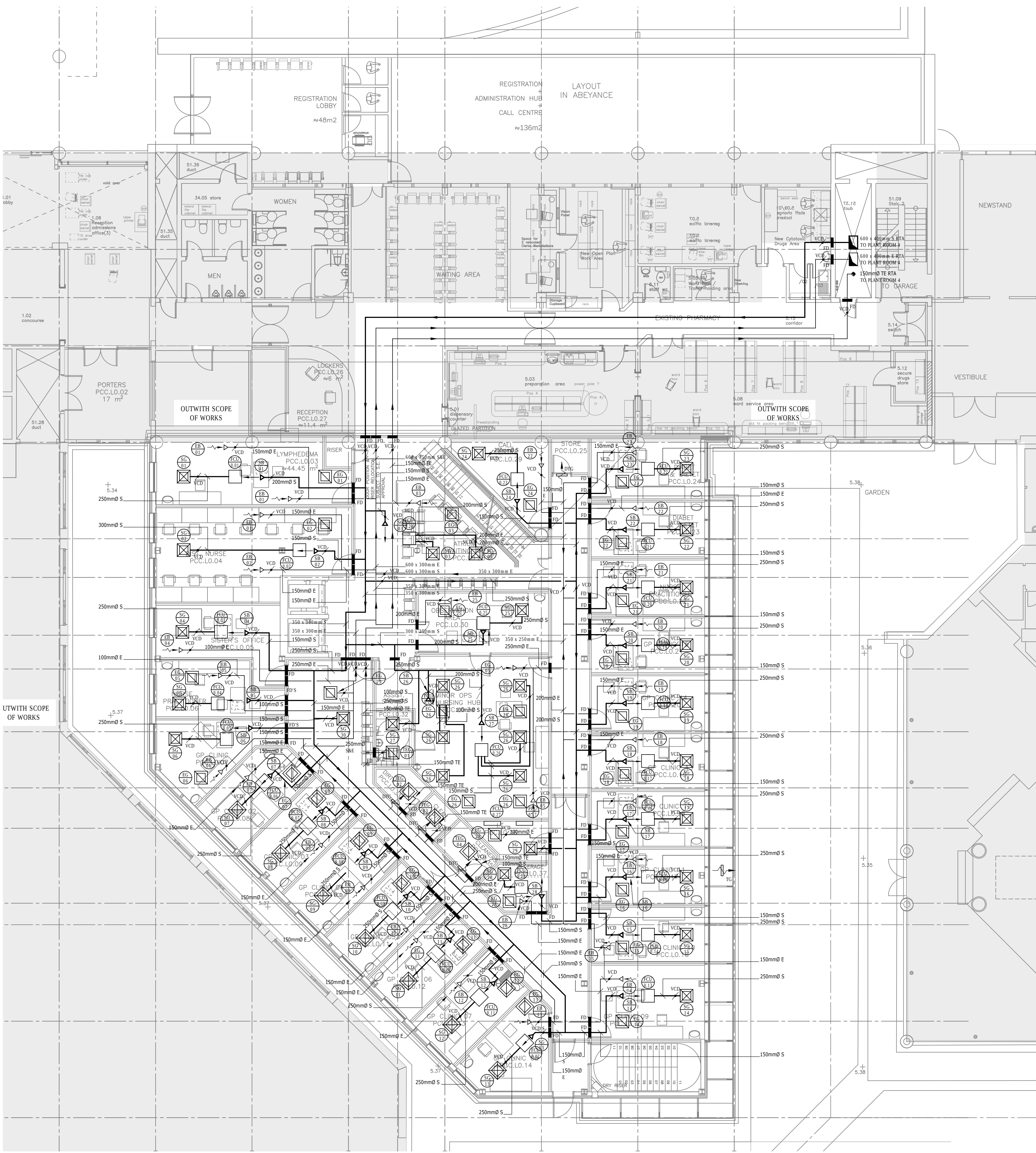
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SECOND FLOOR
HEATING
LAYOUT

Project No:	Scale (8A1):	Drawn:	Date:
310000176	1:100	MK	DEC 2017
Drawing No:	Rev:		
RAM-PCC-02-DR-M-00202	T01		



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- Notes
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 - ALL EQUIPMENT WILL BE INSTALLED IN COMPLIANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
 - ALL DUCTWORK TO BE IDENTIFIED IN ACCORDANCE WITH BS1710.
 - ALL DUCTWORK SHALL BE MANUFACTURED, INSTALLED, TESTED AND COMMISSIONED IN STRICT ACCORDANCE WITH DW144, DW143, DW151, DW171, DW172, DW173, DW174 & CIBSE COMMISSIONING CODES.
 - ALL DUCTWORK PASSING THROUGH FIRE WALLS, FIRE BARRIERS OR FIRE RATED FLOORS WILL HAVE FIRE DAMPERS INSTALLED WITH A RATING MATCHING THAT OF THE BARRIER/FLOOR.
 - THE DUCTWORK SERVING THE KITCHEN EXTRACTION SYSTEM AND RISING TO ROOF LEVEL WILL BE FIRE RATED DUCT AND WILL HAVE FIRE RATED ACCESS DOORS AT EACH LEVEL ALLOWING INTERNAL CLEANING.
 - ID BANDS WILL BE FITTED ON ALL DUCTWORK AT A MINIMUM OF 3.0M CENTRES.
 - ALL SUPPLY AND EXTRACT DUCTWORK TO BE INSULATED (EXCLUDING TOILET EXTRACT SYSTEMS).
 - FLEXIBLE VENTILATION DUCTWORK SHALL ONLY BE USED FOR THE FINAL CONNECTIONS TO THE GRILLES. ALL EXCESS FLEXIBLE DUCTWORK SHALL BE CUT BACK TO A MINIMUM OF 500mm WHEN MAKING FINAL CONNECTIONS.
 - FINAL BRANCH SIZES OF DUCTWORK TO EACH FCU TO BE 150mmØ UNLESS STATED OTHERWISE.
 - DOOR TRANSFER GRILLES TYPE/DETAILS TO BE FOUND IN MECHANICAL EQUIPMENT SCHEDULE. COLOURS TO BE SPECIFIED BY THE ARCHITECT.
 - LOUVRES AND ROOF COWLS SHALL BE FITTED WITH BIRD MESHES AND ACCESS PANELS TO BE INSTALLED IN CONNECTING DUCTWORK TO ALLOW CLEANING. ALL LOUVRES SHALL BE SUITABLE FOR INTEGRATION INTO COMPOSITE ARCHITECTURAL PANELS - AS ARCHITECT'S SPECIFICATION. EXACT LOCATIONS TO BE AGREED WITH ARCHITECT.
 - ACCESS DOORS SHALL BE PROVIDED ADJACENT ALL FIRE DAMPERS, VOLUME CONTROL DAMPERS AND HEATER BATTERIES & EITHER SIDE OF AIR TURNS.
 - FCUs TO COME COMPLETE WITH PLENUM BOXES.
 - VENTILATION RATES SIZED BASED ON M&E CRITICAL SYSTEM MATRIX.
 - DUCTWORK SIZED BASED ON CIBSE GUIDE B STANDARDS.

LEGEND -

S	SUPPLY DUCTWORK
E	EXTRACT DUCTWORK
TE	TOILET EXTRACT DUCTWORK
RTA/RFB	RISE TO ABOVE/RISE FROM BELOW
DFA/DTB	DROP FROM ABOVE/DROP TO BELOW
FD	FIRE DAMPER
VCD	VOLUME CONTROL DAMPER
SG	SUPPLY GRILLE
EG	EXTRACT GRILLE
BS	BELLMOUTH SUPPLY
BE	BELLMOUTH EXTRACT
DTG	DOOR TRANSFER GRILLE
FCU	4 PIPE FAN COIL UNIT
SG REF	SUPPLY GRILLE REFERENCE
EG REF	EXTRACT GRILLE REFERENCE
TE REF	TOILET EXTRACT GRILLE REFERENCE
FCU REF	FAN COIL UNIT REFERENCE
BS REF	SUPPLY BELLMOUTH REFERENCE
BE REF	EXTRACT BELLMOUTH REFERENCE

T01	TENDER ISSUE	JUN 2018	NH	GMC
P01	RIBA STAGE 3	DEC 2017	MK	GMC
Rev	Description	Date	By	App

TENDER

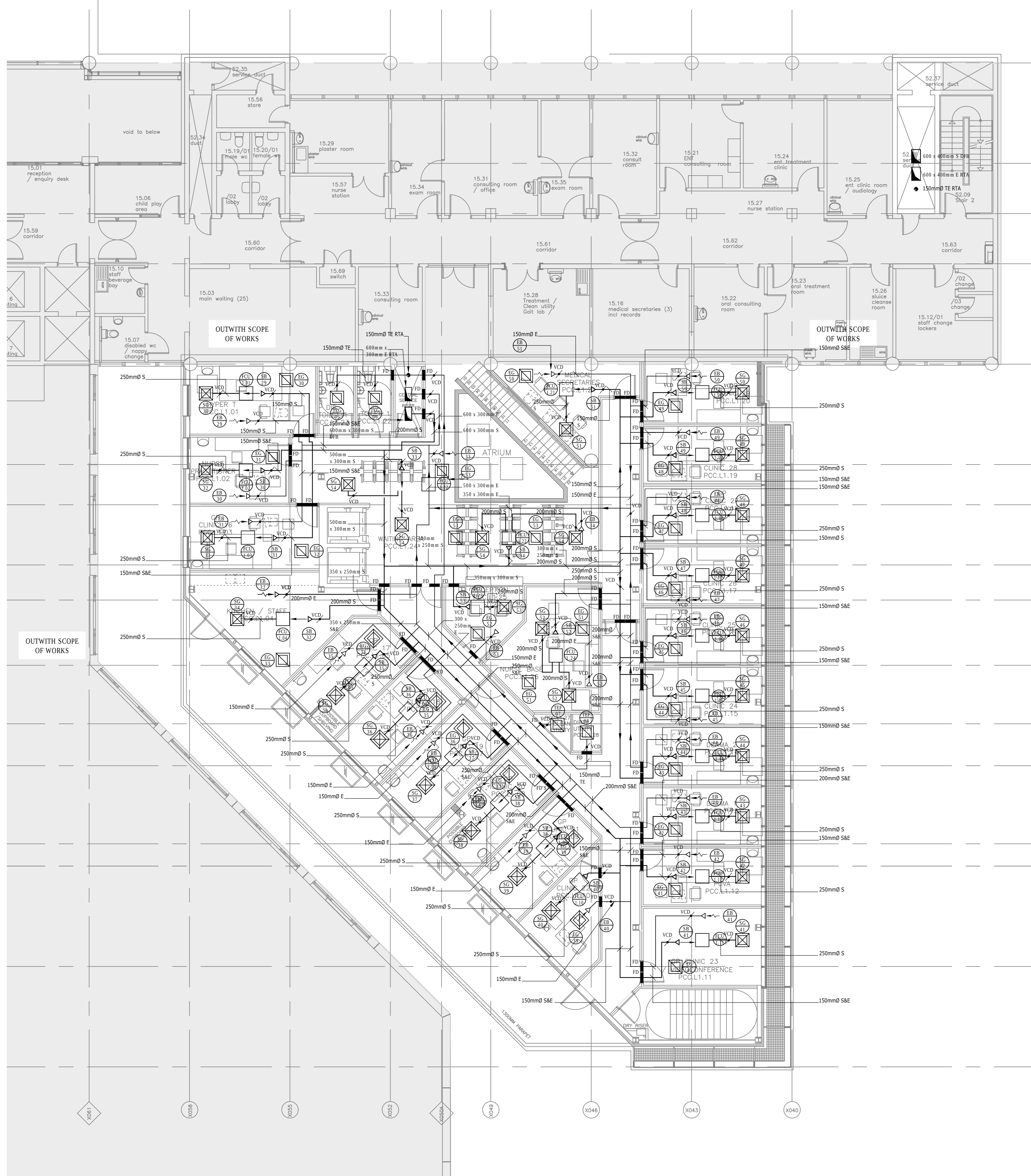
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GROUND FLOOR
VENTILATION
LAYOUT

Project No:	Scale (8A1):	Drawn:	Date:
310000176	1:100	MK	DEC 2017
Drawing No:	Rev:		
RAM-PCC-00-DR-M-00500	T01		



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Notes

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LEGEND:-

- | | |
|---------|---------------------------------|
| E | SUPPLY DUCTWORK |
| E | EXTRACT DUCTWORK |
| TE | TOILET EXTRACT DUCTWORK |
| RTA/RTR | RISE TO ABOVE/RISE FROM BELOW |
| DFA/DTB | DROP FROM ABOVE/DROP TO BELOW |
| | FIRE DAMPER |
| | VOLUME CONTROL DAMPER |
| | SUPPLY GRILLE |
| | EXTRACT GRILLE |
| | BELLMOUTH SUPPLY |
| | BELLMOUTH EXTRACT |
| | DOOR TRANSFER GRILLE |
| | 4 PIPE FAN COIL UNIT |
| | SUPPLY GRILLE REFERENCE |
| | EXTRACT GRILLE REFERENCE |
| | TOILET EXTRACT GRILLE REFERENCE |
| | FAN COIL UNIT REFERENCE |
| | SUPPLY BELLMOUTH REFERENCE |
| | EXTRACT BELLMOUTH REFERENCE |

P01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	MK LN	GMC
Rev	Description	Date	By Chk	App

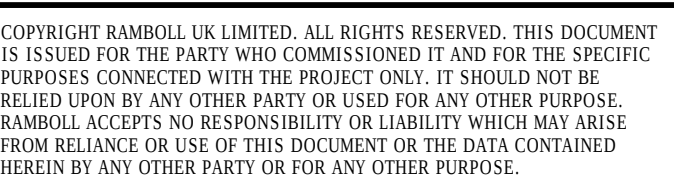
TENDER

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FIRST FLOOR VENTILATION LAYOUT

Project No: 310000176	Scale (@A1): 1:100	Drawn: MK	Date: DEC 2017
Drawing No: RAM-PCC-01-DR-M-00501			Rev: T01

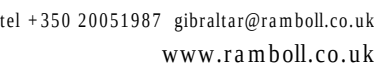


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LEGEND -	
S	SUPPLY DUCTWORK
E	EXTRACT DUCTWORK
TE	TOILET EXTRACT DUCTWORK
RTA/RFB	RISE TO ABOVE/RISE FROM BELOW
DFA/DTB	DROP FROM ABOVE/DROP TO BELOW
	FIRE DAMPER
	VOLUME CONTROL DAMPER
	SUPPLY GRILLE
	EXTRACT GRILLE
	BELLMOUTH SUPPLY
	BELLMOUTH EXTRACT
	DOOR TRANSFER GRILLE
DTG	
	4 PIPE FAN COIL UNIT
	SUPPLY GRILLE REFERENCE
	EXTRACT GRILLE REFERENCE
	TOILET EXTRACT GRILLE REFERENCE
	FAN COIL UNIT REFERENCE
	SUPPLY BELLMOUTH REFERENCE
	EXTRACT BELLMOUTH REFERENCE

P01	TENDER ISSUE	JUN 2018	NH EQ	GMC
P01	RIBA STAGE 3	DEC 2017	MK LN	GMC
Rev	Description	Date	By Chk	App

TENDER

EUROPORT
EXTENSION

SECOND FLOOR VENTILATION LAYOUT

Project No: 310000176	Scale (@A1): 1:100	Drawn: MK	Date: DEC 2017
Drawing No: RAM-PCC-02-DR-M-00502			Rev: T01

New PCC - M&E, B&C, and IM&T Equipment and Specifications

M&E System	Specific Equipment Required	System requirements	
Boilers	LTHW boilers	In accordance with HTM03-01 - Primary CT Flow 85 deg C Ret. 75 deg C @ 0.6 bar	
Toilet Auto Flush Systems	Auto flush (toilets)		
Supply & Extract Fans	Supply and Extract fans	In accordance with HTM03-01	
Cold Water Pipework & Valves	Cold installations to be installed in accordance with HSGL8 and HTM04-01 - Mains GIRPI - sub systems Quickfit Polypipe (tested 17bar)	As per HTM04-01 requirements, all must be WRAS approved (no flexibles) - 6 bar	Cold – Keep the COLD - <20 deg C within 2 minutes (consider tank cooling coils chilled jackets on mains water – main temp differential from intake to furthest point 2 deg C) (no greater than a 2 °C rise in temp from inlet to furthest outlet
Hot Water Pipework & Valves	Hot installations to be installed in accordance with HSGL8 and HTM04-02 - Mains GIRPI - sub systems Quickfit Polypipe (tested 17bar) - Note HSG L8 – COSSH control of substances hazardous to health GIB - MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS, 1996 GIB - FACTORIES (PROTECTION OF WORKERS FROM RISKS RELATED TO EXPOSURE TO BIOLOGICAL AGENTS AT WORK) REGULATIONS 2006	65 primary flow 55 primary return - TMV's to be fitted in patient areas ONLY - 4.5 bar - Basins – Flow 50-60 deg C; return 50-55 deg C (50> deg C within 1 minute) - TMV – Type 2 or 3 TMV set to flow hot 41-43 deg C after 1 minute.	This is about reducing risk to patient's particularly vulnerable and Immunocompromised patients using the PCC – i.e. legionella, Pseudomonas and risk of scolding Legionella does not survive well below 20 deg C, and above 50 deg. C. Pseudomonas survives well down to a temperature of <3 deg C, but has a slightly lower tolerance to heat than Legionella, <50 deg C
LTHW Pipework & Valves	Steel seamless or heavy duty RED band	BS1387/1967	
Chilled Water Pipework & Valves	Steel seamless or heavy duty RED band	BS1387/1967	
AHU (Ultra Clean)	Open to manufacturer	In accordance with HTM03-01 Parts A and B	
Piped Medical Gasses	No PMGS planned although bottle manifolds may be required	In accordance with HTM02-01	
Insulation of pipework and ducts	Non specific but must meet British and European standards, and where fitted externally to the building MUST be protected against bird and rodent damage	Meet or exceed the requirements of Approved Document Part L and therefore meet the latest requirements for Department of Health premises.	
Trend BMS Systems	Trend 963 head end - latest versions of outstation (allow for spare point capacity)	In accordance with HTM07 and HTM08	
GHA side chilled pumps	Pumps are VSD controlled	Primary flow 6 deg C return 12 deg C	
Vacuum POD system	Sample POD transfer system	Not required under the scheme	
AHU Validation	Validation of HVAC to HTM03-01 once installed	As required post installation	
Fire dampers	Fire dampers within ductwork between each fire compartment	Building Regs and BS9999:2008	
Audiology Equipment	Advice on soundproof booths for audiology rooms	HBN's need to be consulted	
Medical Air and Vac	Required for building 9 Dental medical air and vacuum	In accordance with HTM02-01	
Nures Call	Panic and Cardiac Arrest - no in-patient requirements	In accordance with HTM08 panic and cardiac arrest	
DX Systems	FAN DECKS	PWH-V2 heating and cooling (with variable speed fans)	
Filters	AHU filters G4 and F9 - no HEPA requirements	In accordance with HTM03-01	
Filters	Filter media for AHU's and Fan Decks	In accordance with HTM03-01	
Humidifiers		50 +/- 5% RH	
Bed head Systems	Ceiling and wall mounted medical device arms	As required via room data sheets?	
Dental Chairs/Equipment	Dental Chairs and peripheral devices	7 clinics planned, 5 chairs available at existing PCC	
Solar PV Systems	Solar PV Arrays	Non Planned under scheme?	
Auto Doors	Dorma or other as agreed by the GHA	Need to be Fire and Access Control integrated	
Fire and Security	Installation and Maint of Gent Fire Systems, and CEM access control	Gent Fire Systems, and CEM access control	
Lifts	Passenger lifts - energy efficiency and motor room accessibility	In accordance with HTM08	
UPS/IPS Systems	To cover data centre racks	In accordance with HTM06-02	
Generators	Maintenance Contractor	2 x 1.2 MW machines - spare capacity to include PCC load under current strategy	
Bed head Trunking	Bed head trunking systems	In accordance with HTM08-03, HTM06-02, HTM02-01	
Metering	Energy Metering at main distribution	Schneider Virtual Meters	
Audio Equipment	Patient call announcements		
Emergency Lighting	ABB LED Emergency lighting modules	In accordance with RRO2005, HTM05-01 and HTM06-02	
Infrastructure Wiring	Wiring, Containment etc to BS 7671 17TH EDITION (latest amendments)	Above BS 7671 recommended specs (future proofing) Power 4.5 ring circuits, 2.5 lighting circuits	
LV Switchgear	Main LV Panel Manufacturer	In accordance with HTM06-02 - PCC fed from SW2 LV panel - 3x spare 400A switches available - Schneider metering will be required	
Lighting	LED lamps as far is as reasonably practicable	LUX level and movement control where appropriate	
Earthing	Detail must be applied to ensuring that earthing arrangements fit with the service	BS EN 7671 and HTM06-02 and 'MEIGaN' (superseded)	
Medical Examination Lamps (LED)	Clinical inspection lamps - bed head / Dado mounted	In accordance with HTM06-02	
B&C Components	Specific Equipment Required	System/Item requirements	
Man Safe Systems	Roof and balcony ledges mansafe wires	In accordance with LOLER	
Door Sets	Depending on application		
Suited Locks	EVVA DPS	SBH Suited system	
Basins	Installed to HTM64 Sanitary Assemblies, central waste outlet, with no overflows	In accordance with HSGL8 and HTM64, HTM04-01	
Ceiling Tiles	Anti-bacterial		
Paint	Anti-bacterial washable		
Wall protectors	Protection against damage - beds, chairs, trolleys		
Taps	Horne TMV taps or Armitage Shanks Markwik 21 taps - sensor control where appropriate	In conformance with HTM64 (2006), PRH 8941.0.6, HTM04-01, HBN 00.09.	
Waste water systems	Non specific		
Sewage systems	Non specific		
Window locks and restrictors		Lockable and in patient areas fitted with restrictors so that the opening is no more than 100mm	
Window cleaning	System to enable window cleaning		
Services above ceilings	Adequate access hatches to allow additional services installation		
Fire compartmentation	Provision for services expansion through fire compartment walls		
Salt water system	PVC pipework		
IM&T Components	Specific Equipment Required	System/Item requirements	
CCTV	CCTV systems	Need to ensure that the existing digital matrix / server can take the additional cameras	
Server Room	Airdale	Need to be provided with purpose built floor plenum A/C units DX (no wet systems)	
Network Cable	Non specific	Non specific	
General Requirements		Needs to be positioned on the floor plate so that points are within a maximum 100m cable length	
		Access control on entry doors	
		Duplex UPS's (200% full load capacity; non sync) required to prevent 15-20 dip between failure and generator on line - switchgear to provide external manual bypass facilities	

36. Room Data Sheet

IT Room

Room number to be agreed

PLEASE CONSULT WITH THE GHA IT DEPT. FOR THEIR SPECIFIC REQUIREMENTS

IT Server Room	Needs to be positioned on the floor plate so that points are within a maximum 100m cable length						
	Need to be provided with purpose built floor plenum A/C units DX (no wet systems)						
	S/E	0 PA	1.5 A/C	18-25 C	19 C	N/A	30-55%
	Installation of adequate racks to serve the area						
	Access control on entry doors						
	Duplex UPS's (200% full load capacity; non sync) required to prevent 15-20 dip between failure and generator on line - switchgear to provide external manual bypass facilities						

41. Room Data Sheet GYM

Room numbers to be agreed

ADB		Room Data Sheet		Q0617	
Project:		PCC01		Paediatrics at Europort	
Department:					
Room:		Q0617		Gymnasium	
Room Number:				Revision Date: 16/01/18	
Activities:		1) Physical exercise. 2) Individual or group active exercise treatment. 3) Assessment and rehabilitative work to improve mental and physical abilities individually or in group under supervision of therapists and staff.			
Personnel:		1 - 2 staff, up to 4 patients.			
Planning Relationships:					
Space Data:		Area (m²):	30.00	Height (mm):	2700
Notes:		Design notes: This room provides off the ward activities. This room may be used for special exercise by some patients under the supervision of physiotherapy staff. Specialist skills will be required to supervise the use of equipment. All staff who are responsible for using or supervising the use of gymnasium equipment must be properly trained. Design solution notes: The call repeat lamp is situated over the door outside the room. Component list notes: All the equipment project team option. Mental Health patient use of space: Where there is a significant risk of assault or self harm all furniture and fittings are required to be robust, anti ligature, prevent opportunities for concealment and meet infection control requirements while being therapeutic and domestic in style. The risk management advisor should determine the level of requirements for each room to ensure that appropriate safe access is provided for service users and staff.			

ADB	Room Environmental Data	Q0617
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Project:	PCC01	Paediatrics at Europort
Department:		
Room:	Q0617	Gymnasium
Room Number:		Revision Date: 16/01/18

TEMPERATURE AND VENTILATION	Requirements	Notes
Permissible Space Temperature Range(dry bulb) (degC):	18 - 28	
Heating Design Temperature (dry bulb)(degC):	22	
Minimum Air Changes (AC/hr):	>3	
Ventilation Type:	S/E	
Pressure Relative to Adjoining Space:	0 or -ve	
Supply Air: Final Filter Class	G4	
Permissible Relative Humidity Range (%):	Uncontrolled	
General Notes:		
LIGHTING		
Type Of Control:	N	
Daytime General Service Illuminance (Lux):	300	
Daytime Specific Service Illuminance (Lux):		
Nighttime General Service Illuminance (Lux):		
Nighttime Specific Service Illuminance (Lux):		
Local Task Illuminance (Lux):		
Colour Rendering Required:	Y	
Colour Rendering Required Characteristics (Ra):	80	
Unified Glare Rating Limit (UGRL):	22	
Emergency Escape Route Lighting Required:	Y	In accordance with BS 5266 and Health Technical Memorandums
Standby Lighting Grade - General Lighting:		
Standby Lighting Grade - Local Lighting:		
General Notes:		
RISK		
Clinical Risk Category:		
Non-clinical Business Continuity Risk Category:		
General Notes:		
NOISE		
Noise Intrusion (dB) 1hr day:	45	
Noise Intrusion (dB) 1hr night:	-	
Noise Intrusion (dB) f night:	-	
Maximum Internal Noise from M&E Services (NR):	40	Total noise of MEP services under normal operation across the range 63Hz to 4kHz inclusive.
Room Sound-insulation Parameters - Privacy:	Moderate	Reference to Table 3 of the Department of Health 'Acoustics: Technical design manual 4032:0.6:England'.
Room Sound-insulation Parameters - Noise Generation:	High	
Noise Sensitivity:	Not	
Sound-insulation Rating (dB D nT,w):		
General Notes:		
SAFETY/FIRE		
Maximum Surface Temperature (DegC):	43	
Domestic Hot Water Discharge Temperature (DegC):		
Maximum Cold Water Discharge Temperature (DegC):		
General Notes:		
Type of Automatic Fire Detection:	Smoke (fitted with protective guards)	L1 in accordance with HTM (Air sampling system to be considered for ease of maintenance)

ADB	Room Design Character	Q0617
Project:	PCC01	Paediatrics at Europort
Department:		
Room:	Q0617	Gymnasium
Room Number:		Revision Date: 16/01/18
Walls:	Wall finishes to comply with Performance Requirements in HBN 00-10 Part B:Walls and Ceilings (2013) Wall finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part B:Walls and Ceilings.	
Floor:	Floor finishes to comply with Performance Requirements in HBN 00-10 Part A:Flooring (2013) Floor finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part A:Flooring.	
Ceiling:	Ceiling finishes to comply with Performance Requirements in HBN 00-10 Part B:Walls and Ceilings (2013) Ceiling finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part B:Walls and Ceilings.	
Doorsets:	Configuration, glazing, fire rating, security, etc. to be determined by Project Team. Refer to HBN 00 04 (2013) for effective clear door widths. 1 doorset: 1 x personnel, wheelchair & equipment access (1500mm) In Mental Health accommodation doorsets, including ironmongery, should comply with the requirements set out in HBN 03 01.	
Windows:	Essential Clear glass with solar and privacy control. Designation to be validated against current documentation (HBN 00 10 Part D: Windows and associated hardware (2013)) In Mental Health accommodation windows and glazing should comply with the requirements set out in HBN 03 01.	
Internal Glazing:	Not required	
Hatch:	Not required	
Notes:	All finishes selected must have an appropriate risk assessment to accompany the design decision. Infection Control must be consulted as described in HBN 00-10.	

**01.& 19. Room Data Sheet
GP Clinic(s)**

28 standard clinics
Room numbers to be agreed

1 clinic will have videoconferencing capabilities
(Room number to be confirmed)

ADB		Room Data Sheet		C0237	
Project:	PCC01	Primary Care at Europort			
Department:	PCC01	Primary Care Centre			
Room:	C0237	GP Consulting/examination room: double-sided couch access			
Room Number:		Revision Date:		17/01/18	
Activities:	1) Consultations may take place. 2) Sterile supplies and consumables are stored on a trolley. 3) User may undress and dress in privacy. 4) Electronic patient records (EPRs) may be accessed and updated. 5) Clinical hand washing. 6) Discussions and interviews may take place. 7) Carrying out examinations and assessment of patient. 8) Patient may arrive on foot or in a wheelchair. 9) Examinations of the patient may be carried out from one or both sides of the couch. 10) Minimally invasive clinical procedures may be undertaken from one or both sides of the couch. 11) Call systems may be used.				
Personnel:	1 x patient. 1-2 x staff. 1 x other (escort).				
Planning Relationships:					
Space Data:	Area (m²):	16.00	Height (mm):	2700	
Notes:	This room includes a 3-section couch, alternatively, it may accommodate a 2-section couch or specialist couch. The call repeat lamp is situated over the door outside the room. The following items are shown on the room layout but are optional: - patient/staff call (although expected where a patient will be left unattended); - room in use switch and indicator. The following items may be provided: - a small printer; - a small lockable drawer; - dimming switch. Piped medical gases may be required for some clinical specialties. Workstations have been placed in Consult/ exam rooms at 900mm. Local policy may prefer a desk up to 1200mm to facilitate working practice. . Separate data and voice outlets may be used where structure cabling solutions are not available.				

ADB	Room Environmental Data		C0237
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Project:	PCC01	Primary Care at Europort
Department:	PCC01	Primary Care Centre
Room:	C0237	GP Consulting/examination room: double-sided couch access
Room Number:		Revision Date: 17/01/18

TEMPERATURE AND VENTILATION	Requirements	Notes
Permissible Space Temperature Range(dry bulb) (degC):	18 - 25	
Heating Design Temperature (dry bulb)(degC):	23	
Minimum Air Changes (AC/hr):	>1.5	
Ventilation Type:	S/E	
Pressure Relative to Adjoining Space:	0 or +ve	
Supply Air: Final Filter Class	G4	
Permissible Relative Humidity Range (%):	Uncontrolled	
General Notes:		
LIGHTING		
Type Of Control:	N	
Daytime General Service Illuminance (Lux):	300	WP
Daytime Specific Service Illuminance (Lux):		
Nighttime General Service Illuminance (Lux):		
Nighttime Specific Service Illuminance (Lux):		
Local Task Illuminance (Lux):	1000	Bed level (provided by the mobile examination lamp)
Colour Rendering Required:	Y	
Colour Rendering Required Characteristics (Ra):	80	
Unified Glare Rating Limit (UGRL):	19	
Emergency Escape Route Lighting Required:	Y	In accordance with BS 5266 and Health Technical Memorandums
Standby Lighting Grade - General Lighting:	B	
Standby Lighting Grade - Local Lighting:		
General Notes: Refer to SLL Lighting Guide 2 for more detailed guidance		
RISK		
Clinical Risk Category:		
Non-clinical Business Continuity Risk Category:		
General Notes:		
NOISE		
Noise Intrusion (dB) 1hr day:	40	
Noise Intrusion (dB) 1hr night:	-	
Noise Intrusion (dB) f night:	-	
Maximum Internal Noise from M&E Services (NR):	35	Total noise of MEP services under normal operation across the range 63Hz to 4kHz inclusive.
Room Sound-insulation Parameters - Privacy:	Confidential	Reference to Table 3 of the Department of Health 'Acoustics: Technical design manual 4032:0.6:England'.
Room Sound-insulation Parameters - Noise Generati	Typical	
Noise Sensitivity:	Medium	
Sound-insulation Rating (dB D nT,w):		
General Notes:		
SAFETY/FIRE		
Maximum Surface Temperature (DegC):	43	
Domestic Hot Water Discharge Temperature (DegC)	41	
Maximum Cold Water Discharge Temperature (Deg	<20	
General Notes:		
Type of Automatic Fire Detection:	Smoke	
General Notes:		

ADB	Room Design Character	C0237
Project:	PCC01	Primary Care at Europort
Department:	PCC01	Primary Care Centre
Room:	C0237	GP Consulting/examination room: double-sided couch access
Room Number:		Revision Date: 17/01/18
Walls:	Wall finishes to comply with Performance Requirements in HBN 00-10 Part B:Walls and Ceilings (2013) Wall finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part B:Walls and Ceilings.	
Floor:	Floor finishes to comply with Performance Requirements in HBN 00-10 Part A:Flooring (2013) Floor finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part A:Flooring.	
Ceiling:	Ceiling finishes to comply with Performance Requirements in HBN 00-10 Part B:Walls and Ceilings (2013) Ceiling finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part B:Walls and Ceilings.	
Doorsets:	Configuration, glazing, fire rating, security, etc. to be determined by Project Team. HTM 58 (Mar-2005) Refer to HBN 00-04 (May-2007) for effective clear door widths. 1 doorset: 1 x personnel, wheelchair & equipment access (1000mm) Requirement for hinge protection when areas used by children	
Windows:	Desirable - Project Option Clear glass with solar and privacy control Designation to be validated against current documentation (HTM 55 archived).	
Internal Glazing:	Not required	
Hatch:	Not required	
Notes:	All finishes selected must have an appropriate risk assessment to accompany the design decision. Infection Control must be consulted as described in Performance Requirements for Building Elements Used in Healthcare Facilities 8941:0.6 England.	

ADB	Schedule of Components by Room	C0237
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Project:	PCC01	Primary Care at Europort
Department:	PCC01	Primary Care Centre
Room:	C0237	GP Consulting/examination room: double-sided couch access
Room Number:		Revision Date: 17/01/18
Audit Date:	Key: (n-old qty) Deletions m-new qty Additions m (n) Quantity changes since audit date	

Quantity			Code	Description	Alt. Code	Grp
New	Trans	Total				
1		1	BAS101	BASIN, medium, hospital pattern, vitreous china, no tap holes, no overflow, integral back outlet, 500W 400D.		1
1		1	CAL003	PUSH BUTTON, patient/staff call (help) with socket for patient hand-held unit		1
1		1	CAL007	PULL/PUSH BUTTON, staff emergency call, reset and integral/adjacent indicator lamp		1
1		1	CAL034	LAMP, repeat call, patient/staff or staff emergency or cardiac call		1
5		5	HOO019	HOOK, single, small, wall mounted		1
1		1	LIG053	LUMINAIRE, examination, wall mounted, adjustable, 1000 lux		1
1		1	LIG073	ILLUMINATED SIGN, 'Room in use'		1
1		1	OUT005	SOCKET outlet, switched, 13 amp, single		1
5		5	OUT010	SOCKET outlet, switched, 13 amp, twin		1
1		1	OUT049	CONNECTION UNIT, switched, 13 amp, flex outlet		1
2		2	OUT131	SOCKET outlet data/voice, double.		1
1		1	SWC025	SWITCH, light		1
1		1	SWC076	SWITCH, 'Room in use' illuminated sign.		1
1		1	TAP892	TAP, thermostatic mixer internal TMV, or external TMV to HTM04-01, non-touch		1
1		1	TRA183	TRACK, curtain, two sided, 2600W 2800D		1
1		1	WAS107	TRAP, bottle, 1.1/4 in, plastic resealing.		1
1		1	DIS013	DISPENSER, paper towel, wall mounted		1
1		1	DIS030	DISPENSER, soap, disposable single cartridge, lever action, wall mounted		1

ADB	Schedule of Components by Room	C0237
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Project:	PCC01	Primary Care at Europort
Department:	PCC01	Primary Care Centre
Room:	C0237	GP Consulting/examination room: double-sided couch access
Room Number:		Revision Date: 17/01/18
Audit Date: 17/01/18	Key: (n-old qty) Deletions m-new qty Additions m (n) Quantity changes since audit date	

Quantity			Code	Description	Alt. Code	Grp
New	Trans	Total				

23. Room Data Sheet Hypertension Clinic

Room numbers to be agreed

ADB		Room Data Sheet		C0237	
Project:	PCC01	Primary Care at Europort			
Department:	PCC01	Primary Care Centre			
Room:	C0237	Hypertension Clinic			
Room Number:		Revision Date:		17/01/18	
Activities:	1) Consultations may take place. 2) Sterile supplies and consumables are stored on a trolley. 3) User may undress and dress in privacy. 4) Electronic patient records (EPRs) may be accessed and updated. 5) Clinical hand washing. 6) Discussions and interviews may take place. 7) Carrying out examinations and assessment of patient. 8) Patient may arrive on foot or in a wheelchair. 9) Examinations of the patient may be carried out from one or both sides of the couch. 10) Minimally invasive clinical procedures may be undertaken from one or both sides of the couch. 11) Call systems may be used.				
Personnel:	1 x patient. 1-2 x staff. 1 x other (escort).				
Planning Relationships:					
Space Data:	Area (m²):	16.00	Height (mm):	2700	
Notes:	This room includes a 3-section couch, alternatively, it may accommodate a 2-section couch or specialist couch. The call repeat lamp is situated over the door outside the room. The following items are shown on the room layout but are optional: - patient/staff call (although expected where a patient will be left unattended); - room in use switch and indicator. The following items may be provided: - a small printer; - a small lockable drawer; - dimming switch. Workstations have been placed in Consult/ exam rooms at 900mm. Local policy may prefer a desk up to 1200mm to facilitate working practice. . Separate data and voice outlets may be used where structure cabling solutions are not available.				

ADB	Room Environmental Data		C0237
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Project:	PCC01	Primary Care at Europort
Department:	PCC01	Primary Care Centre
Room:	C0237	Hypertension Clinic
Room Number:		Revision Date: 17/01/18

TEMPERATURE AND VENTILATION	Requirements	Notes
Permissible Space Temperature Range(dry bulb) (degC):	18 - 25	
Heating Design Temperature (dry bulb)(degC):	23	
Minimum Air Changes (AC/hr):	>1.5	
Ventilation Type:	S/E	
Pressure Relative to Adjoining Space:	0 or -ve	
Supply Air: Final Filter Class	G4	
Permissible Relative Humidity Range (%):	Uncontrolled	
General Notes:		
LIGHTING		
Type Of Control:	N	
Daytime General Service Illuminance (Lux):	300	WP
Daytime Specific Service Illuminance (Lux):		
Nighttime General Service Illuminance (Lux):		
Nighttime Specific Service Illuminance (Lux):		
Local Task Illuminance (Lux):	1000	Bed level (provided by the mobile examination lamp)
Colour Rendering Required:	Y	
Colour Rendering Required Characteristics (Ra):	80	
Unified Glare Rating Limit (UGRL):	19	
Emergency Escape Route Lighting Required:	Y	In accordance with BS 5266 and Health Technical Memorandums
Standby Lighting Grade - General Lighting:	B	
Standby Lighting Grade - Local Lighting:		
General Notes: Refer to SLL Lighting Guide 2 for more detailed guidance		
RISK		
Clinical Risk Category:		
Non-clinical Business Continuity Risk Category:		
General Notes:		
NOISE		
Noise Intrusion (dB) 1hr day:	40	
Noise Intrusion (dB) 1hr night:	-	
Noise Intrusion (dB) f night:	-	
Maximum Internal Noise from M&E Services (NR):	35	Total noise of MEP services under normal operation across the range 63Hz to 4kHz inclusive.
Room Sound-insulation Parameters - Privacy:	Confidential	Reference to Table 3 of the Department of Health 'Acoustics: Technical design manual 4032:0.6:England'.
Room Sound-insulation Parameters - Noise Generati	Typical	
Noise Sensitivity:	Medium	
Sound-insulation Rating (dB D nT,w):		
General Notes:		
SAFETY/FIRE		
Maximum Surface Temperature (DegC):	43	
Domestic Hot Water Discharge Temperature (DegC)	41	
Maximum Cold Water Discharge Temperature (Deg	<20	
General Notes:		
Type of Automatic Fire Detection:	Smoke	
General Notes:		



ADB	Room Design Character	C0237
Project: PCC01 Primary Care at Europort Department: PCC01 Primary Care Centre Room: C0237 Hypertension Clinic Room Number: Revision Date: 17/01/18		
Walls:	Wall finishes to comply with Performance Requirements in HBN 00-10 Part B:Walls and Ceilings (2013) Wall finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part B:Walls and Ceilings.	
Floor:	Floor finishes to comply with Performance Requirements in HBN 00-10 Part A:Flooring (2013) Floor finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part A:Flooring.	
Ceiling:	Ceiling finishes to comply with Performance Requirements in HBN 00-10 Part B:Walls and Ceilings (2013) Ceiling finishes to be selected using the "Selection process for finishes" and "Types of finish by room space" included in HBN 00-10 Part B:Walls and Ceilings.	
Doorsets:	Configuration, glazing, fire rating, security, etc. to be determined by Project Team. HTM 58 (Mar-2005) Refer to HBN 00-04 (May-2007) for effective clear door widths. 1 doorset: 1 x personnel, wheelchair & equipment access (1000mm) Requirement for hinge protection when areas used by children	
Windows:	Desirable - Project Option Clear glass with solar and privacy control Designation to be validated against current documentation (HTM 55 archived).	
Internal Glazing:	Not required	
Hatch:	Not required	
Notes:	All finishes selected must have an appropriate risk assessment to accompany the design decision. Infection Control must be consulted as described in Performance Requirements for Building Elements Used in Healthcare Facilities 8941:0.6 England.	

ADB	Schedule of Components by Room	C0237
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Project:	PCC01	Primary Care at Europort
Department:	PCC01	Primary Care Centre
Room:	C0237	Hypertension Clinic
Room Number:		Revision Date: 17/01/18
Audit Date:	Key: (n-old qty) Deletions m-new qty Additions m (n) Quantity changes since audit date	

Quantity			Code	Description	Alt. Code	Grp
New	Trans	Total				
1		1	BAS101	BASIN, medium, hospital pattern, vitreous china, no tap holes, no overflow, integral back outlet, 500W 400D.		1
1		1	CAL003	PUSH BUTTON, patient/staff call (help) with socket for patient hand-held unit		1
1		1	CAL007	PULL/PUSH BUTTON, staff emergency call, reset and integral/adjacent indicator lamp		1
1		1	CAL034	LAMP, repeat call, patient/staff or staff emergency or cardiac call		1
5		5	HOO019	HOOK, single, small, wall mounted		1
1		1	LIG053	LUMINAIRE, examination, ceiling, adjustable, 1000 lux		1
1		1	LIG073	ILLUMINATED SIGN, 'Room in use'		1
1		1	OUT005	SOCKET outlet, switched, 13 amp, single		1
5		5	OUT010	SOCKET outlet, switched, 13 amp, twin		1
1		1	OUT049	CONNECTION UNIT, switched, 13 amp, flex outlet		1
2		2	OUT131	SOCKET outlet data/voice, double.		1
1		1	SWC025	SWITCH, light		1
1		1	SWC076	SWITCH, 'Room in use' illuminated sign.		1
1		1	TAP892	TAP, thermostatic mixer internal TMV, or external TMV to HTM04-01, non touch,		1
1		1	TRA183	TRACK, curtain, two sided, 2600W 2800D		1
1		1	WAS107	TRAP, bottle, 1.1/4 in, plastic resealing.		1
1		1	DIS013	DISPENSER, paper towel, wall mounted		1
1		1	DIS030	DISPENSER, soap, disposable single cartridge, lever action, wall mounted		1
1 x 2 Cylinder Oxygen cylinder rack required						

The M&E Critical Specifications - FSC

*LED 600x600 units
 preferred at standard
 throughout - EPC Energy
 Efficiency in Buildings

*Max float 28 C

Ground Floor	Room No	Ventilation	Pressure	AC/h	Temp*	Set point	RH	PA / CA	AGSS - Y/N	LED* Dimmerble
Boardroom 1	1	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Meeting room1	2	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Meeting room2	3	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Meeting room3	4	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Meeting room4	5	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Meeting Pod	6	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Boardroom 2	7	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Boardroom 3	8	S/E	0 or + ve	>1.5	18-25	23	N/A	N/A	N	Y
Store	9	E	0 or + ve	<3	18-25	23	N/A	N/A	N	N

The M&E Critical Specifications - CPCC

*LED 600x600 units
preferred at standard
throughout - EPC Energy
Efficiency in Buildings

*Max float 28 C

Ground Floor	Room No	Ventilation	Pressure	AC/h	Temp*	Set point	AHU Filter	RH	PA / CA	LED* Dimmerble
1. Security Desk	B9.LO.01	S/E	0	1,5	18-25	22	G4	N/A	REPEATER	N
2. Consultant Clinic x 2	B9.LO.02/05	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N
3. Consultant Clinic and Colposcopy suite	B9.LO.03	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N
4. Consultant Clinic / Family Room	B9.LO.04	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N
5. Audiology Booth	B9.LO.06a	S/E	0	>1.5	18-25	23	G4	N/A	PA / CA	N
6. Audiology Consulting Office	B9.LO.06b	S/E	0	1,5	18-25	22	G4	N/A	CA	N
7. Patient WC x 4	B9.LO.55/57	E	-ve	<3	18-25	22	N/A	N/A	PA / CA	N
8. Patient Disabled WC	B9.LO.56	E	-ve	<3	18-25	23	N/A	N/A	PA / CA	N
9. Baby Change Area	B9.LO.58	E	-ve	>3	18-25	23	N/A	N/A	PA / CA	N
10. Dirty Utility	B9.LO.51	E	-ve	>3	18-28	22	N/A	N/A	N/A	N
11. Clean Utility	B9.LO.52	E	+ ve	>3	18-28	22	G4	N/A	N/A	N
12. Cleaners Room	B9.LO.36	E	-ve	1,5	Float	Float	N/A	N/A	N/A	N
13. Child Welfare Waiting Area	B9.LO.50	S/E	0	1,5	18-25	22	G4	N/A	PA / CA	N
14. Child Welfare Vaccination	B9.LO.49	S/E	0 or + ve	>3	18-25	22	G4	N/A	CA	N
15. Child Welfare Assessment Clinic x 3	B9.LO.46/47/48	S/E	0	>3	18-25	22	G4	N/A	CA	N
16. Child Welfare Community Midwife	B9.LO.45	S/E	0 or + ve	1,5	18-25	23	G4	N/A	CA	N
17. Child Welfare Breast Feeding Room	B9.LO.44	S/E	0 or + ve	1,5	18-25	23	G4	N/A	PA / CA	Y
18. Child Welfare Kitchenette	B9.LO.35	E	-ve	>3	18-28	22	N/A	N/A	REPEATER	N
19. Child Welfare Weighing Room	B9.LO.33	S/E	0 or + ve	1,5	18-25	23	G4	N/A	PA / CA	N
20. Child Welfare General Store	B9.LO.34	E	-ve	1	Float	Float	N/A	N/A	N/A	N
21. Open Plan Office for 8	B9.LO.32	S/E	0	1,5	18-25	22	G4	N/A	N/A	N
22. Phlebotomy and Treatment Room	B9.LO.31	S/E	0 or + ve	>3	18-25	23	G4	N/A	CA	N
23. GP / Diabetics / Dietetics Clinic	B9.LO.30	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N
24. GP Clinic x 2	B9.LO.28/29	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N
25. SLT Treatment / Assessment Room	B9.LO.42	S/E	0	1,5	18-25	22	G4	N/A	CA	N
26. SLT room with 2 way mirror	B9.LO.41	S/E	0	1,5	18-25	22	G4	N/A	CA	N
27. SLT 1:1 Work Room x 2	B9.LO.37/39	S/E	0	1,5	18-25	22	G4	N/A	CA	N
28. SLT Store Room (general)	B9.LO.38	E	-ve	1	Float	Float	N/A	N/A	N/A	N
29. MDT Room	B9.LO.43	S/E	0	1,5	18-25	22	G4	N/A	CA	N
30. Clinic Nurse Station	B9.LO.40	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	PA / CA	N
31. Reception	B9.LO.01	S/E	0	1,5	18-25	22	G4	N/A	REPEATER	N
32. GP Waiting Area	B9.LO.27	S/E	0	1,5	18-25	22	G4	N/A	CA	N
33. Children's Play Area	B9.LO.27	S/E	0	>1.5	18-25	23	G4	N/A	PA / CA	N

The M&E Critical Specifications - CPCC

*LED 600x600 units
preferred at standard
throughout - EPC Energy
Efficiency in Buildings

*Max float 28 C

Ground Floor	Room No	Ventilation	Pressure	AC/h	Temp*	Set point	AHU Filter	RH	PA / CA	LED* Dimmerble
34. OPD & Therapy Waiting Area	B9.LO.27	S/E	0	>1.5	18-25	22	G4	N/A	PA / CA	N
35. Records & Admin Store	B9.LO.21	S/E	0	1	18-25	22	G4	N/A	N/A	N
36. IT Room	B9.LO.54	S/E	0	1,5	18-25	20-21	N/A	30-55%	N/A	N
37. Secretaries Office for 4	B9.LO.20	S/E	0	1,5	18-25	22	G4	N/A	N/A	N
38. Sensory Room	B9.LO.19	S/E	0	>1.5	18-25	23	G4	N/A	PA / CA	Y
39. Sensory Room & Store	B9.LO.19	S/E	0	1	18-25	23	G4	N/A	N/A	Y
40. Board Room	B9.LO.18	S/E	0	>1.5	18-25	22	G4	N/A	N/A	Y
41. Gym	B9.LO.23	S/E	0	>3	18-25	23	G4	N/A	PA / CA	N
42. Store shared between Gym & OT	B9.LO.24	E	-ve	1	Float	Float	N/A	N/A	N/A	N
43. Physio & OT Activity	B9.LO.24	S/E	0	>3	18-25	23	G4	N/A	PA / CA	N
44. Physio & OT Kitchenette	B9.LO.24	E	-ve	>3	18-25	22	N/A	N/A	REPEATER	N
45. Physio & OT Babies area	B9.LO.24	S/E	0	<3	18-25	23	G4	N/A	PA / CA	N
46. Physio & OT store room	B9.LO.26	E	-ve	1	Float	Float	N/A	N/A	N/A	N
47. Staff Room with lockers	B9.LO.17	S/E	0	>3	18-25	23	G4	N/A	N/A	N
48. Consultants office x 5	B9.LO.12/13/14/15/16	S/E	0	1,5	18-25	22	G4	N/A	N/A	N
49. Centre Managers office	B9.LO.11	S/E	0	1,5	18-25	22	G4	N/A	N/A	N
50. Staff Toilet (disabled friendly)	B9.LO.10	E	-ve	<3	18-25	23	N/A	N/A	PA / CA	N
51. PMDT open plan office for 10	B9.LO.09	S/E	0	1,5	18-25	22	G4	N/A	N/A	N
52. Head of SLT office	B9.LO.08	S/E	0	1,5	18-25	22	G4	N/A	N/A	N
53. Synergy Room open plan office	B9.LO.07	S/E	0	1,5	18-25	22	G4	N/A	N/A	N

The M&E Critical Specifications - PCC

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preferred at standard
throughout - EPC Energy
Efficiency in Buildings

*Max float 28 C

Ground Floor	Room No	Ventilation	Pressure	AC/h	Temp*	Set point	AHU Filter	RH	PA / CA	AGSS - Y/N	LED* Dimmerble
1. 15 x GP Clinics	PCC.LO.07-21	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	N
2. 2 x Nurse Practitioners Clinics	PCC.LO.06/22	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	N
3. Wound Management / Leg Ulcer Area	PCC.LO.30	S/E	0 or + ve	>6	18-25	23	F7	N/A	CA	N	N
4. Nursing Treatment Hub	PCC.LO.31	S/E	0 or + ve	>6	18-25	23	F7	N/A	CA	N	N
5. Assisted Shower shared by 3 and 4 above	PCC.LO.32	E	-ve	>3	18-25	23	N/A	N/A	PA / CA	N	N
6. Dirty Utility	PCC.LO.33	E	-ve	>3	18-28	21	N/A	N/A	N/A	N	N
7. Clean Utility	PCC.LO.34	S/E	+ ve	>3	18-28	21	G4	N/A	N/A	N	N
8. Cleaners Room	PCC.LO.35	E	-ve	>1.5	Float	Float	N/A	N/A	N/A	N	N
9. Store Room (general)	PCC.LO.25	E	-ve	1	Float	Float	N/A	N/A	N/A	N	N
10. Lymphedema Treatment Room	PCC.LO.03	S/E	0 or + ve	>6	18-25	23	G4	N/A	PA / CA	N	N
11. Assisted Shower for Lymphedema	PCC.LO.03	E	-ve	>3	18-25	23	N/A	N/A	PA / CA	N	N
12. District Nurse Office (hot desks for 12 staff)	PCC.LO.04	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
13. Sister's Office (1 person office with meeting)	PCC.LO.05	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
14. Call Centre	PCC.LO.29	S/E	0	1,5	18-25	22	G4	N/A	REPEATER	N	N
15. Triage / Out of Hours Service	PCC.LO.01	S/E	0	1,5	18-25	22	G4	N/A	PA / CA	N	N
21. 2 x Diabetic & Dietetics Clinics	PCC.LO.23/24	S/E	0 or + ve	>3	18-25	23	G4	N/A	PA / CA	N	N
Reception Locker Rm (as per data sheet 45)	PCC.LO.26	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
Main Reception (as per data sheet 16)	PCC.LO.27	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N

The M&E Critical Specifications - PCC

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preferred at standard
throughout - EPC Energy
Efficiency in Buildings

*Max float 28 C

First Floor:	Room No	Ventilation	Pressure	AC/h	Temp*	Set point	AHU Filter	RH	NC Y/N	AGSS - Y/N	LED* Dimmerble
16. Reception / Clerical Hub	PCC.L1.25	S/E	0	1,5	18-25	22	G4	N/A	REPEATER	N	N
17. Waiting Area	PCC.L1.24	S/E	0	1,5	18-25	22	G4	N/A	PA / CA	N	N
18. 2 x Disabled Toilets	PCC.L1.22/23	E	-ve	>3	18-25	23	N/A	N/A	PA / CA	N	N
19. 13 GP Clinics	PCC.L1.16-22 & 24-29	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	N
20. 1 Nurse Practitioner	PCC.L1.02	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	N
22. IT Room	Location TBC	S/E	0	1,5	18-25	19	N/A	30-55%	N/A	N	N
23. Hypertension Clinic	PCC.L1.01	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	N
24. Staff Kitchen / Canteen	PCC.L1.04	S/E	-ve	>3	18-28	22	N/A	N/A	N/A	N	N
25. Medical Secretaries (4 staff)	PCC.L1.21	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
26. Nurse Base (with Clean Utility)	PCC.L1.27	S/E	0 or + ve	>6	18-25	23	G4	N/A	PA/CA	N	N
27. 2 x Dermatology Clinics	PCC.L1.13/14	S/E	0 or + ve	>6	18-25	23	G4	N/A	PA / CA	N	Y
28. PUVA clinic	PCC.L1.12	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	PA / CA	N	N
29. Office GP Video Conference	PCC.L1.23	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	Y
30. Dirty Utility	PCC.L1.28	E	-ve	>3	18-28	23	N/A	N/A	N/A	N	N

The M&E Critical Specifications - PCC

*LED 600x600 units
preferred at standard
throughout - EPC Energy
Efficiency in Buildings

*Max float 28 C

Second Floor:	Room No	Ventilation	Pressure	AC/h	Temp*	Set point	AHU Filter	RH	NC Y/N	AGSS - Y/N	LED* Dimmerble
31. Reception / Clerical Hub	PCC.L2.15	S/E	0	1,5	18-25	22	G4	N/A	REPEATER	N	N
32. Waiting Area	PCC.L2.14	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
33. 2 x Disabled Toilets	PCC.L2.12/13	E	-ve	>3	18-25	23	N/A	N/A	PA / CA	N	N
34. Audiology Booth x 2	PCC.L2.01/03	S/E	0	1,5	18-25	23	G4	N/A	PA / CA	N	N
35. Audiology Office	PCC.L2.02	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
36. 3 x Well Man / Woman Clinics	PCC.L2.04/05/06	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	N
37. Clinical Nurse Manager Office (office for 1 person)	PCC.L2.07	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
38. Unit General Manager Office (office for 1 person)	PCC.L2.08	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
39. Primary Care Manager Office (office for 1 person)	PCC.L2.09	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
40. Board Room (shared with dental)	PCC.L2.10	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	Y
41. Beverage Bay	PCC.L2.11	E	-ve	>1.5	18-28	22	N/A	N/A	N/A	N	N
42. Dental Clinics x 7	PCC.L2.21-27	S/E	0 or + ve	>6	18-25	23	F7	N/A	PA / CA	Y	N
43. Dental X-Ray	PCC.L2.28	S/E	0 or + ve	>1.5	18-25	23	G4	N/A	CA	N	Y
44. Dental Sterilising Room	PCC.L2.29	S/E	0	clean (+6 AC/hr) to dirty (-6AC/h)	18-28	23	F9	N/A	N/A	N	N
45. Dental Changing / Locker Room	PCC.L2.20	S/E	-ve	1,5	18-25	23	N/A	N/A	N/A	N	N
46. Dental Waiting Area	PCC.L2.18	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N
47. Dental Reception	PCC.L2.18	S/E	0	1,5	18-25	22	G4	N/A	REPEATER	N	N
48. Dental Records	PCC.L2.19	S/E	0	1,5	18-25	22	G4	N/A	N/A	N	N



Gentlemen,

CASAIS GIBRALTAR

Att: Mr. Carlos Canhão Esteves

Budget N.º: 2017.026.L.GIB

Work: Europort buildings widening - FSC, CPCC & FSC building

Hon. Sir

In response to Your Excellency query please find attached the value of the Mechanical and Hydraulic Installations of the work title Contract, priority under these clauses and unit price list:

TOTAL PROPOSED VALUE :



1. The above set value It is liquid and includes taxes. Add VAT at the rate in force.
2. The proposal is valid for 30 days period, from which the values may be revised depending on business conditions in force;
3. The budget was made according to the information provided by the Client, without analysis of possible errors and omissions;
4. The equipment considered in the proposal, are trademarks and equivalent models those set out in the Specifications;
5. It is excluded all material and equipment for which we did not have key elements for carrying out their quotations, or are not our specialty, particularly:
 - 5.1 Construction work support (opening and plugging of grooves or trenches, paintings, structures mounting or positioning, " Carottes " and demolitions);
 - 5.2 lifting equipment of equipment cranes,platform lifts, scaffolding structures);
 - 5.3 All kinds of materials,equipment and work that is not set the unit price lists;

Gibraltar 01/10/18

Sincerely,

Budget Department

(Nuno Miguel Santos)

Detailed Proposal

Work: Europort buildings widening - FSC, CPCC & FSC building
Client: CASAIS GIBRALTAR

Type: Mechanical and Plumbing installation
Att: Mr. Carlos Canhão Esteves

Quote #: 2017.026.L.GIB

Date: 1 de outubro de 2018

POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
1	FSC building							
1.1	Flakt Woods new cassette type fan coil units with individual temperature controller. Units with one water coil and one electrical resistance. Siemens individual modulant 2 way valve, Flakt Woods controllers and Kuhn relays, automatic air release valve, TA trim valve, strainer and two ball valves. Connection to the galvanized chilled water piping by soft copper pipping with TA couplings. The electrical resistance control shall be on/ off type.							
1.1.1	(QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9010 Grille + STRA-07 Controller)	Un	9					
1.1.2	Connection Kit for cassettes	Un	9					
1.1.3	Power supply to the fan coil units	Un	9					
1.2	Existing cassette type fan coil units with individual temperature controller, installation. Europort will supply the fan coil unit, Siemens individual modulant 2 way valve, Flakt Woods controllers and Kuhn relays, automatic air release valve, TA trim valve, strainer and two ball valves. Connection to the galvanized chilled water piping by soft copper pipping with TA couplings. The electrical resistance control shall be on/ off type. Per fan coil unit an individual wall control panel is foreseen to be also supplied by Europort.							
1.2.1	FCU (04L Model)	Un	4					
1.2.2	Power supply to the fan coil units	Un	4					
1.2.3	Fan coil units relocation	Un	5					
1.4	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.							
1.4.1	2"	m	50					
1.4.2	1 1/2"	m	40					
1.4.3	1 1/4"	m	50					
1.4.4	1"	m	50					
1.4.5	3/4"	m	10					
2	CPCC building							
2.1	Air Handling Unit AHU.1 (Located on level 07, Plant Room)	Un	1					
2.2	Toilet extract fan TEF.01 (Located on level 07, Plant Room)	Un	1					Excluido

Quote #: 2017.026.L.GIB				Date: 1 de outubro de 2018				
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
2.3	Fan Coil Units Flakt Woods brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.							
2.3.1	QFDK-20-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	Un	11					
2.3.2	QFDK-10-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	Un	31					
2.3.3	QFDK-50-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	Un	1					
2.3.4	QFDK-30-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	Un	2					
2.3.5	Connection Kit for cassettes	Un	45					
2.3.6	Power supply to the fan coil units	m	45					
2.4	Mitsubishi Mono-Split System including individual remote wall mounted temperature controller, with return air temperature sensor. Each unit to come complete with integral condensate pump.							
2,4,1	FCU 0.44 Indoor Units - PKA-M50HA , OUTDOOR - PUHZ-ZRP50VKA2 + PAR-30MAA Controller and with condensate pump	un	2					
2.4.2	Mechanical connections between indoor and outdoor units	m	60					
2,4,3	Power supply to the fan coil units	m	5					
2,5	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.							
2,5,1	2 1/2"	un	25					
2,5,2	2"	un	50					
2,5,3	1 1/2"	un	10					
2,5,4	1 1/4"	un	150					
2,5,5	1"	un	60					
2,5,6	3/4"	un	25					
2,5,7	1/2"	un	15					
2,6	Ventilation							
2,6,1	Dampers							
2,6,1.1	Fire Dampers Ø 125	un	5					
2,6,1.2	Fire Dampers 500x400	un	2					
2,6,1.3	VCD - Volume Control Damper 500x400	un	2					
2,6,1.4	VCD - Volume Control Damper 350x300	un	2					
2,6,1.5	VCD - Volume Control Damper Ø 125	un	50					
2,6,1.6	VCD - Volume Control Damper Ø 160	un	38					
2,6,1.7	VCD - Volume Control Damper Ø 200	un	11					
2,6,1.8	VCD - Volume Control Damper Ø 250	un	6					
2,6,1.9	VCD - Volume Control Damper Ø 315	un	6					
2,6,2	Extraction and supply ducts insulated	vg	1					
2,6,3	Extract Grille							
2,6,3,1	Square Extract Grille, model PCY Size 600	un	74					
2,6,4	Supply Grille and flexible duct							
2,6,4,1	Square Diffuser , model LCP-125-1	un	25					

Quote #: 2017.026.L.GIB				Date: 1 de outubro de 2018				
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
2,6,4,2	Square Diffuser , model LCP-160-1	un	15					
2,6,4,3	Square Diffuser , model LCP-200-1	un	5					
2,6,4,4	Square Diffuser , model LCP-315-1	un	3					
3	PCC building							
	Roof level							
3.1	Air Handling Unit AHU.01 (Located on level 04, Plant Room)	Un	1					
3.2	Toilet extract fan TEF.01 (Located on level 04, Plant Room)	Un	1					
	LEVEL 0							
3.3	Fan Coil Units Trox brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.							
3.3.1	PWX-60/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	Un	27					
3.3.2	PWX-90/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	Un	1					
3.3.3	PWX-120/2-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	Un	1					
3.3.4	Connection Kit for fan coils units	Un	29					
3.3.5	Power supply to the fan coil units	m	29					
3.4	Mitsubishi Mono-Split System including individual remote wall mounted temperature controller, with return air temperature sensor. Each unit to come complete with integral condensate pump.							
3.4.1	Indoor Units - PKA-M50HA , OUTDOOR - PUHZ-ZRP50VKA2t + PAR-30MAA Controller	gv	2					
3.4.2	Mechanical connections between indoor and outdoor units	m	30					
3,4,3	Power supply to the fan coil units	m	10					
3,5	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.							
3,5,1	2 1/2"	un	55					
3,5,2	2"	un	7					
3,5,4	1 1/4"	un	55					
3,5,5	1"	un	44					
3,5,6	3/4"	un	100					
3,5,7	1/2"	un	440					
3,6	Ventilation							
3,6,1	Dampers							
3,6,1.1	Fire Dampers Ø 100	un	5					

Quote #: 2017.026.L.GIB		Date: 1 de outubro de 2018						
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
3,6,1.2	Fire Dampers Ø 160	un	48					
3,6,1.3	Fire Dampers Ø 200	un	4					
3,6,1.4	Fire Dampers Ø 250	un	3					
3,6,1.5	Fire Dampers 300X250	un	1					
3,6,1.6	Fire Dampers 350X300	un	1					
3,6,1.7	Fire Dampers 600X350	un	2					
3,6,1.2	Fire Dampers 600x400	un	2					
3,6,1.3	VCD - Volume Control Damper 600x400	un	2					
3,6,1.4	VCD - Volume Control Damper 600x350	un	2					
3,6,1.4	VCD - Volume Control Damper 350x300	un	1					
3,6,1.5	VCD - Volume Control Damper Ø 100	un	5					
3,6,1.6	VCD - Volume Control Damper Ø 160	un	56					
3,6,1.7	VCD - Volume Control Damper Ø 200	un	15					
3,6,1.8	VCD - Volume Control Damper Ø 250	un	20					
3,6,1.9	VCD - Volume Control Damper Ø 315	un	1					
3,6,2	Extraction and supply ducts insulated	vg	1					
3,6,3	Extract Grille							
3,6,3,1	Square Extract Grille, model PCY Size 600	un	37					
3,6,4	Supply Grille and flexible duct							
3,6,4,1	Square Diffuser , model LCP-125-1	un	2					
3,6,4,2	Square Diffuser , model LCP-160-1	un	9					
3,6,4,3	Square Diffuser , model LCP-200-1	un	6					
3,6,4,4	Square Diffuser , model LCP-250-1	un	73					
3,6,4,4	Square Diffuser , model LCP-315-1	un	6					
LEVEL 1								
3,7	Fan Coil Units Trox brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.							
3,7,1	PWX-60/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	un	23					
3,7,2	PWX-90/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	un	2					
3,7,3	Connection Kit for cassettes	un	25					
3,7,4	Power supply to the fan coil units	un	25					
3,8	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.							
3,8,1	2"	m	4					
3,8,2	1 1/2"	m	22					
3,8,3	1 1/4"	m	22					
3,8,4	1"	m	33					
3,8,5	3/4"	m	88					
3,8,6	1/2"	m	475					
3,9	Ventilation							

Quote #: 2017.026.L.GIB				Date: 1 de outubro de 2018				
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
3,9,1	Dampers							
3,9,2	Fire Dampers Ø 160	Un	39					
3,9,3	Fire Dampers Ø 200	Un	9					
3,9,4	Fire Dampers 400x250	Un	1					
3,9,5	Fire Dampers 350x250	Un	1					
3,9,3	Fire Dampers 600x300	Un	2					
3,9,4	VCD - Volume Control Damper 600x300	Un	2					
3,9,7	VCD - Volume Control Damper Ø 160	Un	38					
3,9,8	VCD - Volume Control Damper Ø 200	Un	17					
3,9,9	VCD - Volume Control Damper Ø 250	Un	23					
3,9,10	Extraction and supply ducts insulated	gv	1					
3,9,11	Extract Grille							
3,9,11,1	Square Extract Grille, model PCY Size 600	un	31					
3,9,12	Supply Grille							
3,9,12,1	Square Diffuser , model LCP-250-1	un	26					
	LEVEL 2							
3,9,13	Fan Coil Units Trox brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.							
3,9,13,1	PWX-60/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller	un	21					
3,9,13,2	PWX-90/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller	un	2					
3,9,13,3	PWX-90/2-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller	un	3					
3,9,13,4	Connection Kit for cassettes	un	26					
3,9,13,5	Power supply to the fan coil units	un	26					
3,9,14	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.							
3,9,14,1	2"	m	17					
3,9,14,2	1 1/2"	m	11					
3,9,14,3	1 1/4"	m	27					
3,9,14,4	1"	m	72					
3,9,14,5	3/4"	m	33					
3,9,14,6	1/2"	m	370					
3,9,15	Ventilation							
3,9,15,1	Dampers							
3,9,15,1,1	Fire Dampers Ø 160	un	26					
3,9,15,1,2	Fire Dampers Ø 200	un	20					
3,9,15,1,3	Fire Dampers Ø 250	un	1					
3,9,15,1,4	Fire Dampers 350X250	un	1					
3,9,15,1,5	Fire Dampers 400X300	un	2					
3,9,15,1,6	Fire Dampers 600X300	un	3					

Quote #: 2017.026.L.GIB					Date: 1 de outubro de 2018			
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
3,9,15,1,7	Fire Dampers 700x700	un	4					
3,9,15,1,8	VCD - Volume Control Damper 700x700	un	2					
3,9,15,1,9	VCD - Volume Control Damper 600x400	un	2					
3,9,15,1,10	VCD - Volume Control Damper 600x300	un	3					
3,9,15,1,11	VCD - Volume Control Damper 400X300	un	4					
3,9,15,1,12	VCD - Volume Control Damper 350X250	un	1					
3,9,15,1,13	VCD - Volume Control Damper Ø 160	un	35					
3,9,15,1,14	VCD - Volume Control Damper Ø 200	un	35					
3,9,15,1,15	VCD - Volume Control Damper Ø 250	un	26					
3,9,15,2	Extraction and insufflation systems, consisting of insulated ducts and various insulated connection accessories	gv	1					
3,9,15,3	Extract Grille Square Extract Grille, model PCY Size 600	un	32					
3,9,15,4	Supply Grille							
3,9,15,4,1	Square Diffuser , model LCP-125-1	un	1					
3,9,15,4,2	Square Diffuser , model LCP-160-1	un	1					
3,9,15,4,3	Square Diffuser , model LCP-200-1	un	6					
3,9,15,4,4	Square Diffuser , model LCP-250-1	un	23					
3,9,15,4,5	Square Diffuser , model LCP-200-3	un	3					
3,9,16	Static ventilators forsmoke vents including buttons and electrical installation without power supply.	un	3					
3,9,17	Static ventilators forsmoke vents including buttons and electrical installation without power supply.	un	1					
	Note: This BOQ was based on drawings received on 21/08/2018							
TOTAL (DUTY INCLUDED)								

Detailed Proposal

Work: Europort buildings widening - FSC, CPCC & FSC building
Client: CASAIS GIBRALTAR

Type: Mechanical and Plumbing installation
Att: Mr. Carlos Canhão Esteves

Quote #: 2017.026.L.GIB

Date: 01/10/2018

POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
1	FSC							
1.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.							
1.1.1	DN40	m	60					
1.1.2	DN63	m	30					
1.2	Foul water drainage							
1.2.1	DN40	m	12					
1,3	Rain water drainage							
1.3.1	DN110 (Fersil)	m	50					
1,4	Water supply MULTILAYER piping with insulation on hot water supply and penny valves							
1,4.1	25mm	m	30					
1,4.2	16 mm	m	40					
1,4.3	Thermostatic mixing valve	un	2					
1,5	Geberit Pluvia system	Gv	1					
1,6	Sanitary ware installation including silicone, excluding siphons and supports.	Un.	1					
1,7	Taps supports excluding eventual accessories.	Un.	1					
1,8	Water heaters and accessories installation including rigid piping	Un.	2					
2	CPCC building							
2.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.							
2.1.1	DN40	m	181					
2.1.2	DN63	m	143					
2.2	Foul water drainage							
2.2.1	DN40	m	60					
2.2.2	DN90	m	155					
2,3	Rain water drainage							
2.3.1	DN110	m	50					
2.3.2	DN160	m	9					

Quote #: 2017.026.L.GIB				Date: 01/10/2018				
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
2,4	Water supply MULTILAYER piping with insulation on hot water supply and penny valves							
2.4,1	25mm	m	90					
2.4,2	16 mm	m	210					
2.4,3	Thermostatic mixing valve	m	30					
2,5	Sanitary ware installation including silicone, excluding siphons and supports.	Un.	35					
2,6	Taps supports excluding eventual accessories.	Un.	29					
2,7	Water heaters and accessories installation including rigid piping	Un.	27					
3	PCC building							
	LEVEL 0							
3.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.							
3.1.1	DN40	m	150					
3.1.2	DN63	m	40					
3.2	Foul water drainage							
3,2,1	DN32	m	70					
3,2,2	DN40	m	50					
3,2,3	DN75	m	100					
3,2,4	DN110	m	60					
3.3	Water supply MULTILAYER piping with insulation on hot water supply and penny valves							
3,3,1	32mm	m	40					
3,3,2	25 mm	m	68					
3,3,3	20 mm	m	100					
3,3,4	16 mm	m	465					
3,3,5	Thermostatic mixing valve	un	26					
3,4	Sanitary ware installation including silicone, excluding siphons and supports.	Un.	26					
3,5	Taps supports excluding eventual accessories.	Un.	26					
	LEVEL 1							
4.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.							
4.1.1	DN40 (branches)	m	150					
4.1.2	DN63 (manifold)	m	40					
4.2	Foul water drainage							

Quote #: 2017.026.L.GIB					Date: 01/10/2018			
POS.	DESIGNATION	UC	QT	Unit. Price. MAT	TOTAL MAT	Unt. Price Labour	TOTAL Labour	TOTAL
4.2.1	DN32	m	70					
4.2.2	DN40	m	50					
4.2.3	DN75	m	100					
4.2.4	DN110	m	60					
4.3	Water supply MULTILAYER piping with 9mm insulation on hot water supply and penny valves							
4.3,1	32mm	m	5					
4.3,2	25 mm	m	50					
4.3,3	20 mm	m	80					
4.3,4	16 mm	m	500					
4.3,5	Thermostatic mixing valve	m	24					
4,4	Sanitary ware installation including silicone, excluding siphons and supports.	Un.	25					
4,5	Taps supports excluding eventual accessories.	Un.	23					
	LEVEL 2							
5.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.							
5.1.1	DN40 (branches)	m	150					
5.1.2	DN63 (manifold)	m	40					
5.2	Foul water drainage							
5.2.1	DN32	m	70					
5.2.2	DN40	m	50					
5.2.3	DN75	m	100					
5.2.4	DN110	m	60					
5.3	Water supply MULTILAYER piping with 9mm insulation on hot water supply and penny valves							
5.3,1	32mm	m	8					
5.3,2	25 mm	m	50					
5.3,3	20 mm	m	80					
5.3,4	16 mm	m	270					
5.3,5	Thermostatic mixing valve	m	16					
5,4	Geberit Pluvia system	Gv	1					
5,5	Sanitary ware installation including silicone, excluding siphons and supports.	Un.	15					
5,6	Taps supports excluding eventual accessories.	Un.	12					
	Note: This BOQ was based on drawings received on 21/08/2018							
TOTAL (DUTY INCLUDED) _____								

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- Notes
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 3. ALL LEVELS ARE IN METERS ABOVE OR BELOW DATUM UNLESS STATED OTHERWISE
 4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS AND SPECIFICATIONS.
 5. ALL SYSTEMS ARE TO BE DESIGNED TO BE VIA ELECTRIC COILS WITHIN FAN COIL UNITS. REFER TO EQUIPMENT SCHEDULES FOR FURTHER DETAILS.
 6. THE LOCATION OF THE FAN COIL UNIT CONTROLS ARE INDICATED AND FINAL INSTALLATION.

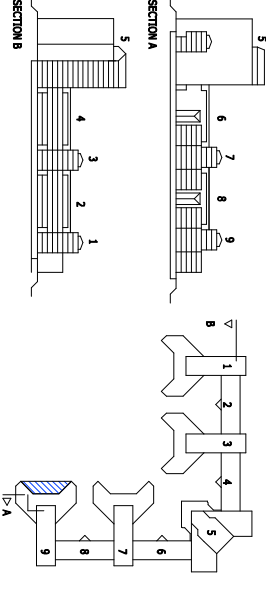
- LEGEND -
- PREPWORK IN CEILING VOID
 - FAN COIL UNIT
 - NEW FAN COIL UNIT
 - TEMPERATURE CONTROLLER
 - FAN
 - DRIP TO ABOVE
 - DRIP TO BELOW
 - DRIP FROM ABOVE
 - EXISTING FAN COIL UNIT
 - EXISTING FAN COIL UNIT RELOCATED

AS BUILT DRAWING

9-M-0335 G

NO.	DATE	DESCRIPTION	BY	CHECKED	APPROVED
1	14/06/2018	AS BUILT DRAWING	MM	EQ	GMC
2	14/06/2018	REVISION	MM	EQ	GMC
3	14/06/2018	REVISION	MM	EQ	GMC
4	14/06/2018	REVISION	MM	EQ	GMC
5	14/06/2018	REVISION	MM	EQ	GMC
6	14/06/2018	REVISION	MM	EQ	GMC
7	14/06/2018	REVISION	MM	EQ	GMC
8	14/06/2018	REVISION	MM	EQ	GMC
9	14/06/2018	REVISION	MM	EQ	GMC
10	14/06/2018	REVISION	MM	EQ	GMC
11	14/06/2018	REVISION	MM	EQ	GMC
12	14/06/2018	REVISION	MM	EQ	GMC
13	14/06/2018	REVISION	MM	EQ	GMC
14	14/06/2018	REVISION	MM	EQ	GMC
15	14/06/2018	REVISION	MM	EQ	GMC
16	14/06/2018	REVISION	MM	EQ	GMC
17	14/06/2018	REVISION	MM	EQ	GMC
18	14/06/2018	REVISION	MM	EQ	GMC
19	14/06/2018	REVISION	MM	EQ	GMC
20	14/06/2018	REVISION	MM	EQ	GMC

EUROPORT – GIBRALTAR



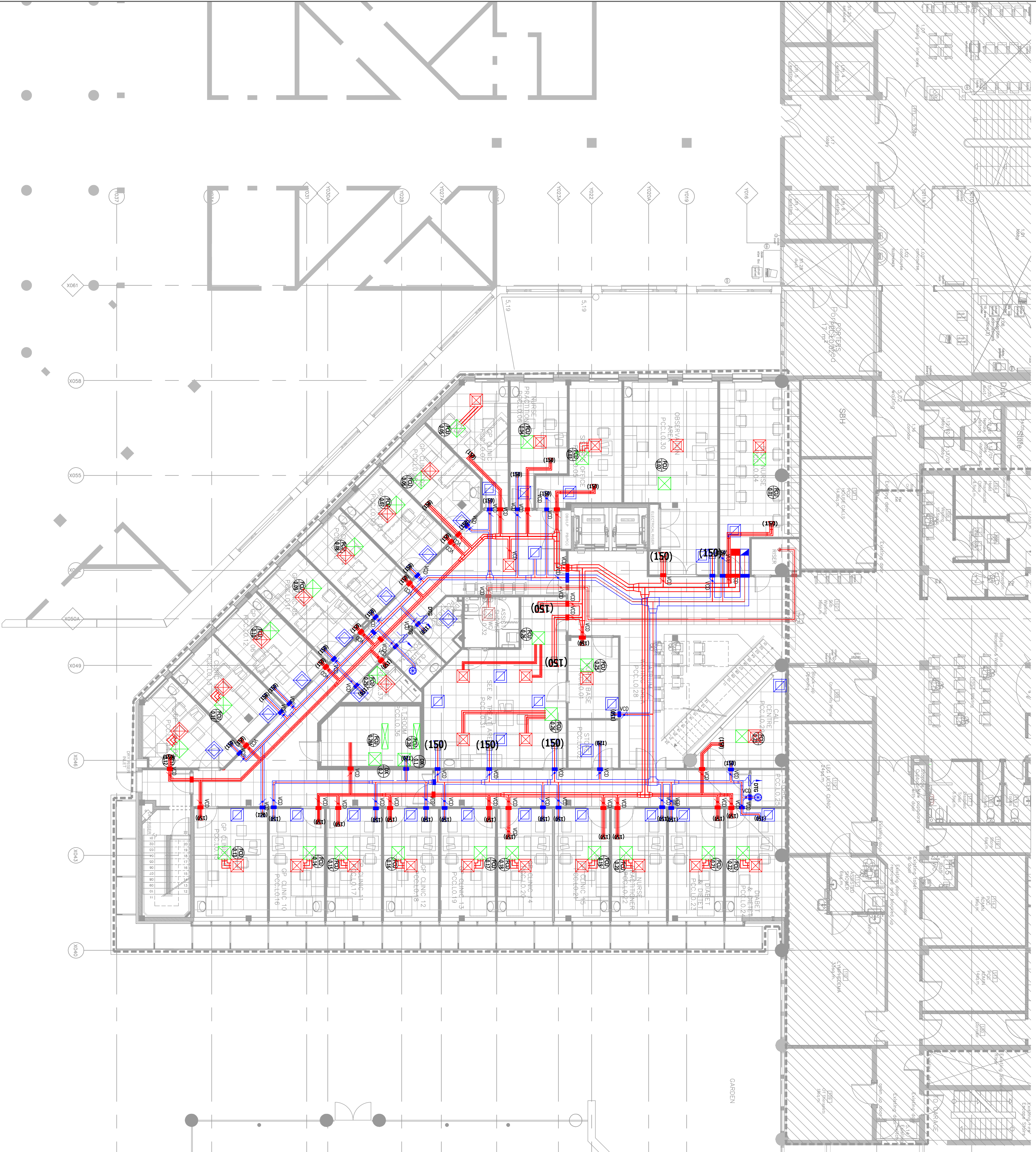
GROUND FLOOR (FAN COIL) LAYOUT

DESIGN	CHECK	APPROV.	SCALE	FLOOR	C/SBS	LEVEL	DATE	REV.
MM	EQ	GMC	1:100	0	0	0	9-M-0335	G

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NOTES

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED
3. ALL LEVELS ARE IN METRES ABOVE OR BELOW DATUM UNLESS OTHERWISE STATED
4. THE DRAWING IS TO BE USED IN CONNECTION WITH ALL RELEVANT SPECIFICATIONS AND STANDARDS
5. ALL DIMENSIONS ARE TO BE TAKEN FROM THE FACE OF THE WALLS UNLESS OTHERWISE STATED
6. ALL DIMENSIONS ARE TO BE TAKEN FROM THE FACE OF THE WALLS UNLESS OTHERWISE STATED
7. ALL DIMENSIONS ARE TO BE TAKEN FROM THE FACE OF THE WALLS UNLESS OTHERWISE STATED
8. ALL DIMENSIONS ARE TO BE TAKEN FROM THE FACE OF THE WALLS UNLESS OTHERWISE STATED
9. ALL DIMENSIONS ARE TO BE TAKEN FROM THE FACE OF THE WALLS UNLESS OTHERWISE STATED
10. ALL DIMENSIONS ARE TO BE TAKEN FROM THE FACE OF THE WALLS UNLESS OTHERWISE STATED
11. THE DUCTWORK SERVING THE EXTRACT SYSTEM AND RISING TO ROOF LEVEL WILL BE FIRE RATED DUCT AND WILL HAVE FIRE RATED ACCESS DOORS IN EACH FLOOR ALLOWING INTERNAL CLEANING.
12. DUCTWORK WILL BE FITTED ON ALL DUCTWORK AT A MINIMUM OF 3.0M CENTRES.
13. ALL SUPPLY AND EXTRACT DUCTWORK TO BE INSULATED (EXCLUDING TOILET EXTRACT SYSTEMS).
14. FLEXIBLE VENTILATION DUCTWORK SHALL ONLY BE USED FOR THE FINAL CONNECTIONS TO THE GRILLS. ALL EXCESS FLEXIBLE DUCTWORK SHALL BE CUT BACK TO A MINIMUM OF 500mm WHEN MAKING FINAL CONNECTIONS.
15. FINAL BRANCH SIZES OF DUCTWORK TO EACH FLOOR TO BE 160mm UNLESS STATED OTHER WISE.
16. ROOM TRANSFER GRILLS PRESENTS TO BE FOUND IN MECHANICAL EQUIPMENT ROOMS. GRILLS TO BE SPECIFIED BY THE ARCHITECT.
17. LOUNGES AND ROOF COWS SHALL BE FITTED WITH BIRD NETS AND ACCESS PANELS TO BE INSTALLED IN CONNECTING DUCTWORK TO ALLOW CLEANING. ARCHITECTURAL DETAILS SHALL BE SPECIFIED BY THE ARCHITECT. EACH LOCATION TO BE AGREED WITH ARCHITECT.
18. ACCESS DOORS SHALL BE PROVIDED ADJACENT ALL FIRE DAMPERS. VOLUME CONTROL DAMPERS AND BIRCH DAMPERS & ENTER SIDE OF AIR VENTS.
19. FCU TO COME COMPLETE WITH FLEXIBLE BOXES.
20. VENTILATION RATES SIZED BASED ON ONE OFFICIAL SYSTEM MANUAL.
21. DUCTWORK SIZED BASED ON CASE GUIDE 9 SYMBOLOS.

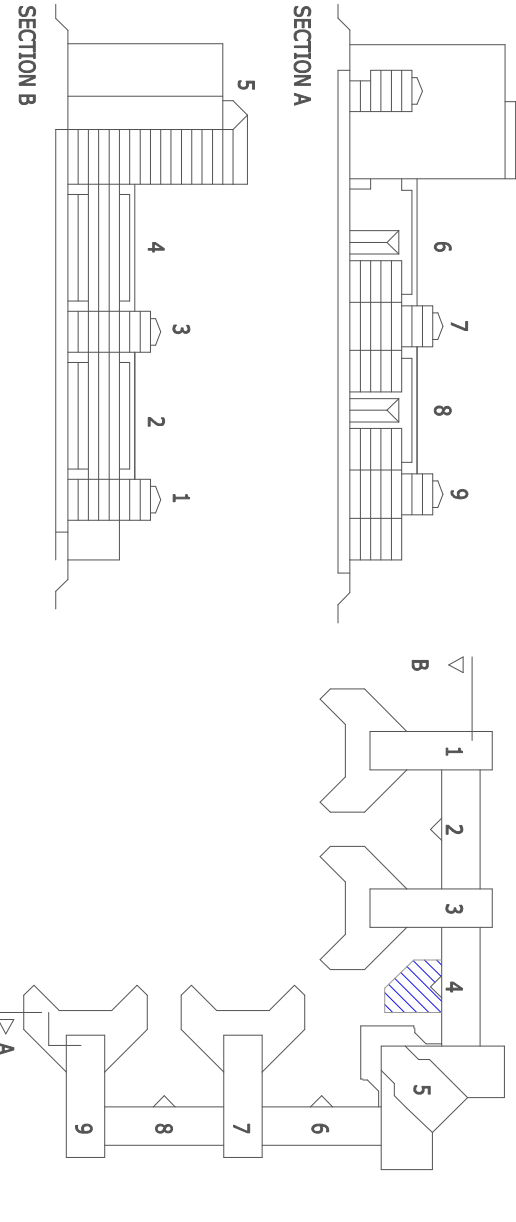


AS BUILT DRAWING

P-M.0390 H

REV.	DATE	SUBJECT	DRAWN	CHECK	APPROV.
1	05/11/2019	AS BUILT DRAWING			
2	26 MAR 2019	UPDATE DRAWING			
3	12 DEC 2018	UPDATE DRAWING			
4	31 AUG 2018	REVISED TENDER ISSUE			
5	27 JUL 2018	REVISED TENDER ISSUE			
6	09 JUL 2018	REVISED TENDER ISSUE			
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EUROPORT - GIBALTAR



GROUND FLOOR VENTILATION LAYOUT

DESIGN	CHECK	APPROV.	SCALE	FLOOR	C/SB	LEVEL	DWG. NO.	REV.
INT.	INT.	INT.	1:100	00	00	00	P-M.0390	H

PROJECT NAME

Europort - CPCC Building

Air Ballance



Ref	Ground Floor	Room No	Ventilation	Requirements					As Built			*Max float 28 C			
				Área m2	Air Volume m3/h	Air Volume l/s	Pressure	AC/h Recommended	Air Volume m3/h	Air Volume l/s	AC/h Provided	Temp*	Set point	AHU Filter	RH
1	LOBBY / SECURITY	B9.L0.01	S/E	14,57	58	16	0	1,5	58	16	1,5	18-25	22	G4	N/A
2	CLINIC 1	B9.L0.02	S/E	9,29	37	10	0 or + ve	>1.5	38	11	1,5	18-25	23	G4	N/A
3	CLINIC 2	B9.L0.03	S/E	9,90	39	11	0 or + ve	>1.5	39	11	1,5	18-25	23	G4	N/A
4	CLINIC 3	B9.L0.04	S/E	12,84	51	14	0 or + ve	>1.5	52	14	1,5	18-25	23	G4	N/A
5	CLINIC 4	B9.L0.05	S/E	9,51	38	11	0 or + ve	>1.5	39	11	1,5	18-25	23	G4	N/A
6	CLINIC 5	B9.L0.06	S/E	11,42	45	13	0 or + ve	>1.5	45	13	1,5	18-25	23	G4	N/A
7	CLINIC 6	B9.L0.07	S/E	12,00	48	13	0 or + ve	>1.5	49	14	1,5	18-25	23	G4	N/A
8	HEAD OF STL.	B9.L0.08	S/E	5,62	22	6	0	1,5	22	6	1,5	18-25	22	G4	N/A
9	CLINIC 7	B9.L0.09	S/E	11,97	48	13	0 or + ve	>1.5	48	13	1,5	18-25	23	G4	N/A
10	STAFF TOILET	B9.L0.10	E	4,38	35	10	+ve	<3	36	10	3	18-25	23	N/A	N/A
11	CENTRE MANAGER	B9.L0.11	S/E	8,09	32	9	0	1.5	33	9	1,5	18-25	22	G4	N/A
12	DENTAL PLANT	B9.L0.12	S/E	8,90	35	10	0	1,5	36	10	1,5	18-25	22	G4	N/A
13	DENTAL CLINIC 7	B9.L0.13	S/E	16,30	259	72	0 or + ve	>6	265	74	6	18-25	23	F7	N/A
14	STORE ROOM	B9.L0.14	S/E	10,00	80	22	0	>3	81	23	3	18-28	23	F9	N/A
15	DENTAL PLANT	B9.L0.15	S/E	8,24	33	9	0	1,5	33	9	1,5	18-25	22	G4	N/A
16	DENTAL CLINIC 6	B9.L0.16	S/E	16,95	270	75	0 or + ve	>6	271	75	6	18-25	23	F7	N/A
17	STAFF ROOM / KITCHENETTE / LOCKERS	B9.L0.17	S/E	24,24	193	54	0	>3	195	54	3	18-25	23	G4	N/A
18	OT KITCHENETTE	B9.L0.18	S/E	7,69	61	17	+ve	>3	62	17	3	18-25	22	N/A	N/A
19	SENSORY ROOM	B9.L0.19	S/E	35,95	143	40	0	>1.5	144	40	1,5	18-25	23	G4	N/A
20	SECRETARY OFFICE	B9.L0.20	S/E	23,52	93	26	0	1,5	94	26	1,5	18-25	22	G4	N/A
21	RECORDS / ADMIN. STORE	B9.L0.21	S/E	10,36	27	8	0	1	28	8	1	18-25	22	G4	N/A
22	RECEPTION	B9.L0.22	S/E	36,64	146	40	0	1,5	150	42	1,5	18-25	22	G4	N/A
23	GYM	B9.L0.23	S/E	32,78	261	72	0	>3	265	74	3	18-25	23	G4	N/A
24	STORE	B9.L0.24													
25	PHYSIO & OT	B9.L0.25	S/E	23,27	185	51	0	>3	186	52	3	18-25	23	G4	N/A
26	STORE	B9.L0.26	E	4,10	33	9	+ve	>3	33	9	3	18-28	22	N/A	N/A
27	WAITING AREA / PLAY AREA	B9.L0.27	S/E	72,41	288	80	0	>1.5	290	81	1,5	18-25	22	G4	N/A
28	DENTAL CLINIC 5	B9.L0.28	E	17,92	285	79	0 or + ve	>6	285	79	6	18-25	23	F7	N/A
29	DENTAL CLINIC 4	B9.L0.29	S/E	16,67	265	74	0 or + ve	>6	268	74	6	18-25	23	F7	N/A
30	DIABETICS + DIETETICS / GP CLINIC 03	B9.L0.30	S/E	11,32	45	12	0 or + ve	>1.5	45	13	1,5	18-25	23	G4	N/A
31	PHLEBOTOMY & TREATMENT	B9.L0.31	S/E	15,00	119	33	0 or + ve	>3	120	33	3	18-25	23	G4	N/A
32	OPEN PLAN OFFICE	B9.L0.32	S/E	25,90	103	29	0	1,5	105	29	1,5	18-25	22	G4	N/A
33	DENTAL CLINIC 3	B9.L0.33	S/E	16,95	270	75	0 or + ve	>6	273	76	6	18-25	23	F7	N/A
34	OT BABY	B9.L0.34	S/E	6,73	54	15	0	<3	54	15	3	18-25	23	G4	N/A
35	DIRTY UTILITY / CLEANERS	B9.L0.36 / 51	E	9,30	74	21	+ve	>3	75	21	3	Float	Float	N/A	N/A
36	1:1 WORK 01	B9.L0.37	S/E	5,65	22	6	0	1,5	23	6	1,5	18-25	22	G4	N/A
37	STORAGE	B9.L0.38	S/E	4,53	12	3	0 or + ve	1	14	4	1	Float	Float	N/A	N/A
38	1:1 WORK 02	B9.L0.39	S/E	5,65	22	6	0	1,5	23	6	1,5	18-25	22	G4	N/A
39	CLINICAL NURSE	B9.L0.40	S/E	7,15	28	8	0 or + ve	>1.5	28	8	1,5	18-25	23	G4	N/A
40	STL 2-WAY MIRROR	B9.L0.41	S/E	7,13	28	8	0	1.5	28	8	1,5	18-25	22	G4	N/A
41	STL ASSESSMENT	B9.L0.42	S/E	32,00	127	35	0	1,5	130	36	1,5	18-25	22	G4	N/A
42	MDT ROOM	B9.L0.43	S/E	12,00	48	13	0	1,5	48	13	1,5	18-25	22	G4	N/A

PROJECT NAME

Europort - CPCC Building

Air Ballance



Ref	Ground Floor	Room No	Ventilation	Requirements					As Built			*Max float 28 C			
				Área m2	Air Volume m3/h	Air Volume l/s	Pressure	AC/h Recommended	Air Volume m3/h	Air Volume l/s	AC/h Provided	Temp*	Set point	AHU Filter	RH
43	BREAST FEEDING	B9.L0.44	S/E	9,33	37	10	0 or + ve	1,5	38	11	1,5	18-25	23	G4	N/A
44	DENTAL CLINIC 2	B9.L0.45	S/E	20,40	324	90	0 or + ve	>6	330	92	6	18-25	23	F7	N/A
45	DENTAL CLINIC 1	B9.L0.46	S/E	19,65	312	87	0 or + ve	>6	315	88	6	18-25	23	F7	N/A
46	STERIL. ROOM	B9.L0.47	S/E	11,71	186	52	0	CLEAN (+6AC/hr) TO DIRTY (- 6AC/hr)	190	53	6	18-28	23	F9	N/A
47	CLINIC 8	B9.L0.48	S/E	11,11	88	25	0	>3	90	25	3	18-25	22	G4	N/A
48	CLINIC 9	B9.L0.49	S/E	12,71	101	28	0	>3	101	28	3	18-25	22	G4	N/A
49	CLINIC 10	B9.L0.50	S/E	12,99	103	29	0	>3	104	29	3	18-25	22	G4	N/A
50	CLINICAL MANAGERS OFFICE	B9.L0.52	S/E	6,44	26	7	0 or + ve	1,5	28	8	1,5	18-28	22	G4	N/A
51	I.T.	B9.L0.54	S/E	16,72	66	18	0	1,5			1,5	18-25	20-21	N/A	30-55%
52	M/F DISABLED HOIST ASSIST TOILET PLUS BABY CHANGE	B9.L0.55	E	10,26	82	23	+ve	<3	82	23	3	18-25	23	N/A	N/A
53	W. TOILET	B9.L0.56	E	3,67	29	8	+ve	<3	29	8	3	18-25	22	N/A	N/A
54	M. TOILETS	B9.L0.57	E	3,23	26	7	+ve	<3	26	7	3	18-25	22	N/A	N/A
55	BABY CHANGING ROOM	B9.L0.58	E	3,66	29	8	+ve	>3	29	8	3	18-25	23	N/A	N/A
56	WAITING AREA	B9.L0.59	S/E	20,00	80	22	0	1,5	81	23	1,5	18-25	22	G4	N/A
57	CLINIC 11	B9.L0.60	S/E	12,73	101	28	0	>3	103	29	3	18-25	22	G4	N/A
58	CLINIC 12	B9.L0.61	S/E	13,30	106	29	0	>3	108	30	3	18-25	22	G4	N/A
59	X-RAY	B9.L0.62 PCC.L2.28	S/E	7,70	31	9	0 or + ve	>1,5	31	9	1,5	18-25	23	G4	N/A
60	WAITING AREA 3	B9.L0.63	S/E	37,00	147	41	0	1,5	149	41	1,5	18-25	22	G4	N/A
61	WAITING AREA 4	B9.L0.64	S/E	27,00	107	30	0	1,5	109	30	1,5	18-25	22	G4	N/A
62	SWITCHBOARD	B9.L0.65	S/E	3,95	16	4	0	1,5			1,5	18-26	23	G5	N/A

PROJECT NAME

Europort - PCC Building

Air Ballance



Ref.	Ground Floor	Room No	Ventilation	Requirements					As Built			*Max float 28 C			
				Área m2	Air Volume m3/h	Air Volume l/s	Pressure	AC/h Recommended	Air Volume m3/h	Air Volume l/s	AC/h Provided	Temp*	Set point	AHU Filter	RH
1	Nurse Base	PCC.LO.01	S/E	8,9	36,1	10,0	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
2	Store	PCC.LO.02	E	5,3	14,4	4,0	-ve	1	57,6	16	1	Float	Float	N/A	N/A
3	Dist. Nurse	PCC.LO.04	S/E	36,2	146,7	40,8	0	1,5	147,6	41	1,5	18-25	22	G4	N/A
4	Sister's Office	PCC.LO.05	S/E	16,6	67,2	18,7	0	1,5	68,4	19	1,5	18-25	22	G4	N/A
5	Nurse Practitioner	PCC.LO.06	S/E	13,6	55,0	15,3	0 or + ve	>1.5	64,8	18	1,5	18-25	23	G4	N/A
6	GP Clinic	PCC.LO.07	S/E	14,7	59,3	16,5	0 or + ve	>1.5	61,2	17	1,5	18-25	23	G4	N/A
7	GP Clinic 2	PCC.LO.08	S/E	12,9	52,4	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
8	GP Clinic 3	PCC.LO.09	S/E	13,0	52,7	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
9	GP Clinic 4	PCC.LO.10	S/E	13,0	52,7	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
10	GP Clinic 5	PCC.LO.11	S/E	13,0	52,7	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
11	GP Clinic 6	PCC.LO.12	S/E	13,0	52,7	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
12	GP Clinic 7	PCC.LO.13	S/E	13,0	52,7	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
13	GP Clinic 8	PCC.LO.14	S/E	13,0	52,7	14,6	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
14	GP Clinic 9	PCC.LO.15	S/E	17,8	72,3	20,1	0 or + ve	>1.5	72	20	1,5	18-25	23	G4	N/A
15	GP Clinic 10	PCC.LO.16	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
16	GP Clinic 11	PCC.LO.17	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
17	GP Clinic 12	PCC.LO.18	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
18	GP Clinic 13	PCC.LO.19	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
19	GP Clinic 14	PCC.LO.20	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
20	GP Clinic 15	PCC.LO.21	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
21	Nurse Practitioners Clinics	PCC.LO.22	S/E	13,3	53,9	15,0	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
22	Diabetic & Dietetics Clinics	PCC.LO.23	S/E	13,3	107,7	29,9	0 or + ve	>3	108	30	3	18-25	23	G4	N/A
23	Diabetic & Dietetics Clinics	PCC.LO.24	S/E	13,3	107,7	29,9	0 or + ve	>3	108	30	3	18-25	23	G4	N/A
24	Store	PCC.LO.25	E	2,9	7,8	2,2	-ve	1	57,6	16	1	Float	Float	N/A	N/A
25	Waiting area	PCC.LO.28	S/E	68,7	278,2	77,3	0	1,5	277,2	77	1,5	18-25	22	G4	N/A
26	Call Center	PCC.LO.29	S/E	12,0	48,6	13,5	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
27	Observation Area	PCC.LO.30	S/E	35,9	580,8	161,3	0 or + ve	>6	576	160	6	18-25	23	F7	N/A
28	SEE & Treat Area	PCC.LO.31	S/E	45,8	742,0	206,1	0 or + ve	>6	741,6	206	6	18-25	23	F7	N/A
29	Asssit. Shower & WC	PCC.LO.32	E	6	49	14	-ve	>3	61,2	17	3	18-25	23	N/A	N/A
30	Dirty Util.	PCC.LO.33	E	4,1	33,2	9,2	-ve	>3	57,6	16	3	18-28	21	N/A	N/A
31	Clean Util.	PCC.LO.34	E	3,7	30,0	8,3	+ ve	>3	57,6	16	3	18-28	21	G4	N/A
32	Beverage	PCC.LO.37	S/E	4,5	36,5	10,1	-ve	>3	57,6	16	3	Float	Float	N/A	N/A
33	I.T.Room	PCC.LO.36	S/E	13,0	52,7	14,6	0	1,5	57,6	16	1,5	18-25	20-21	N/A	30-55%

PROJECT NAME

Europort - PCC Building

Air Ballance

Ref.	First Floor	Room No	Ventilation	Requirements					As Built			*Max float 28 C			
				Área m2	Air Volume m3/h	Air Volume l/s	Pressure	AC/h Recommended	Air Volume m3/h	Air Volume l/s	AC/h Provided	Temp*	Set point	AHU Filter	RH
1	Hyper T	PCC.L1.01	S/E	17,87	72	20	0 or + ve	>1.5	72	20	1,5	18-25	23	G4	N/A
2	Nurse Practitioner	PCC.L1.02	S/E	13,11	53	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
3	GP Clinic 16	PCC.L1.03	S/E	16,65	67	19	0 or + ve	>1.5	68,4	19	1,5	18-25	23	G4	N/A
4	Kitchen / Staff	PCC.L1.04	S/E	23,45	190	53	+ve	>3	190,8	53	3	18-28	22	N/A	N/A
5	GP Clinic 17	PCC.L1.05	S/E	15,00	61	17	0 or + ve	>1.5	61,2	17	1,5	18-25	23	G4	N/A
6	GP Clinic 18	PCC.L1.06	S/E	15,00	61	17	0 or + ve	>1.5	61,2	17	1,5	18-25	23	G4	N/A
7	GP Clinic 19	PCC.L1.07	S/E	15,00	61	17	0 or + ve	>1.5	61,2	17	1,5	18-25	23	G4	N/A
8	GP Clinic 20	PCC.L1.08	S/E	15,00	61	17	0 or + ve	>1.5	61,2	17	1,5	18-25	23	G4	N/A
9	GP Clinic 21	PCC.L1.09	S/E	15,00	61	17	0 or + ve	>1.5	61,2	17	1,5	18-25	23	G4	N/A
10	GP Clinic 22	PCC.L1.10	S/E	12,27	50	14	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
11	Dermatology Minor Op Clinic	PCC.L1.11	S/E	18,58	301	84	0 or + ve	>6	302,4	84	6	18-25	23	F7	N/A
12	PUVA	PCC.L1.12	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
13	Derma 1	PCC.L1.13	S/E	13,75	223	62	0 or + ve	>6	223,2	62	6	18-25	23	G4	N/A
14	Derma 2	PCC.L1.14	S/E	13,75	223	62	0 or + ve	>6	223,2	62	6	18-25	23	G4	N/A
15	GP Clinic 24	PCC.L1.15	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
16	GP Clinic 25	PCC.L1.16	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
17	GP Clinic 26	PCC.L1.17	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
18	GP Clinic 27	PCC.L1.18	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
19	GP Clinic 28	PCC.L1.19	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
20	GP Clinic 29	PCC.L1.20	S/E	13,75	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
21	Medical Secretaries	PCC.L1.21	S/E	13,64	55	15	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
22	Dis. Toilet 1	PCC.L1.22	E	3,65	30	8	-ve	>3	57,6	16	3	18-25	23	N/A	N/A
23	Toilet 1	PCC.L1.23	E	4,64	38	10	-ve	>3	57,6	16	3	18-25	23	N/A	N/A
24	Waiting Area	PCC.L1.24	S/E	62,59	253	70	0	1,5	252	70	1,5	18-25	22	G4	N/A
25	Reception	PCC.L1.25	S/E	8,05	33	9	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
26	Nurse Base	PCC.L1.26	S/E	22,47	364	101	0 or + ve	>6	363,6	101	6	18-25	23	G4	N/A
27	Clean Utility	PCC.L1.27	E	1,38	22	6	0 or + ve	>6	57,6	16	6	18-25	23	G4	N/A
28	Dirty Utility	PCC.L1.28	E	2,10	17	5	+ve	>3	57,6	16	3	18-28	23	N/A	N/A

PROJECT NAME

Europort - PCC Building

Air Ballance

Ref.	Second Floor	Room No	Ventilation	Requirements					As Built			*Max float 28 C			
				Área m2	Air Volume m3/h	Air Volume l/s	Pressure	AC/h Recommended	Air Volume m3/h	Air Volume l/s	AC/h Provided	Temp*	Set point	AHU Filter	RH
1	Councillor's Clinic 1	PCC.L2.01	S/E	13,36	54	15	0	1,5	57,6	16	1,5	18-25	23	G4	N/A
2	Councillor's Clinic 2	PCC.L2.02	S/E	10,15	41	11	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
3	Councillor's Clinic 3	PCC.L2.03	S/E	12,72	52	14	0	1,5	57,6	16	1,5	18-25	23	G4	N/A
4	Well Man / Well Woman 1	PCC.L2.04	S/E	15,72	64	18	0 or + ve	>1.5	64,8	18	1,5	18-25	23	G4	N/A
5	Well Man / Well Woman 2	PCC.L2.05	S/E	13,74	56	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
6	Well Man / Well Woman 3	PCC.L2.06	S/E	13,49	55	15	0 or + ve	>1.5	57,6	16	1,5	18-25	23	G4	N/A
7	Community Midwife	PCC.L2.07	S/E	14,72	60	17	0	1,5	61,2	17	1,5	18-25	22	G4	N/A
8	Dr. Vassallo Clinic	PCC.L2.08	S/E	14,72	60	17	0	1,5	61,2	17	1,5	18-25	22	G4	N/A
9	Dietician	PCC.L2.09	S/E	14,72	60	17	0	1,5	61,2	17	1,5	18-25	22	G4	N/A
10	Board Room	PCC.L2.10	S/E	24,77	100	28	0	1,5	100,8	28	1,5	18-25	22	G4	N/A
11	Beverage	PCC.L2.11	S/E	12,73	52	14	+ve	>1.5	57,6	16	1,5	18-28	22	N/A	N/A
14	Waiting Area	PCC.L2.14	S/E	66,9	271	75	0	1,5	86,4	24	1,5	18-25	22	G4	N/A
15	Admin	PCC.L2.15	S/E	21,43	87	24	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
18	Finance Admin.	PCC.L2.18	S/E	9,64	39	11	0	1,5	68,4	19	1,5	18-25	22	G4	N/A
19	Mental Health Waiting Area	PCC.L2.19	S/E	16,58	67	19	0	1,5	57,6	16	1,5	18-25	22	G4	N/A
21	Mental Health Clinic 1	PCC.L2.21	S/E	12,2	49	14	0 or + ve	1,5	57,6	16	1,5	18-25	22	G4	N/A
22	Mental Health Clinic 2	PCC.L2.22	S/E	10,38	42	12	0 or + ve	1,5	57,6	16	1,5	18-25	22	G4	N/A
23	Mental Health Clinic 3	PCC.L2.23	S/E	14,07	57	16	0 or + ve	1,5	57,6	16	1,5	18-25	22	G4	N/A
24	Councillor's	PCC.L2.24	S/E	14	57	16	0	1,5	57,6	16	1,5	18-25	23	G4	N/A
25	Clinical Nurse Manager	PCC.L2.25	S/E	14	57	16	0	1,5	57,6	16	1,5	18-25	23	G4	N/A
26	PCC director	PCC.L2.26	S/E	14	57	16	0	1,5	57,6	16	1,5	18-25	23	G4	N/A
27	PCC Deputy	PCC.L2.27	S/E	14	57	16	0	1,5	57,6	16	1,5	18-25	23	G4	N/A
28	PCC Manager	PCC.L2.28	S/E	14	57	16	0	1,5	57,6	16	1,5	18-25	23	G4	N/A

Requisição interna de material e equipamento

Codg. Destinatário (PEP/CC)		GI0B/00GI-PT05	Nº Rim : 1400_GI-0123 - FSC & CPCC - Chilled water							
Para		Lista Compras	Local entrega: Europort				Datas			
C/C			15/09/2018							
Item N.º	Código SAP	Descrição material ou equipamento	Quant	Uni	Preço unit. Seco	Preço total	Observações	Data necessidade	Data saída (apenas para equipamentos)	Data Chegada
1		QFDK-10-0-2-1-1 Unit + QFDZ-10-06 RAL9010 Grille + STRA-07 Controller	31	Un.			Flaktwoods	13/10/2018		
2		QFDK-20-0-2-1-1 Unit + QFDZ-10-06 RAL9010 Grille + STRA-07 Controller	11	Un.			Flaktwoods	13/10/2018		
3		QFDK-30-0-2-1-1 Unit + QFDZ-10-06 RAL9010 Grille + STRA-07 Controller	2	Un.			Flaktwoods	13/10/2018		
4		QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9010 Grille + STRA-07 Controller	10	Un.			Flaktwoods	13/10/2018		
5		SIEMENS VVP47.10-0.4, 2-WAY VALVE	31	Un.				13/10/2018		
6		SIEMENS VVP47.10-0.63, 2-WAY VALVE	11	Un.				13/10/2018		
7		SIEMENS VVP47.10-1, 2-WAY VALVE	2	Un.				13/10/2018		
8		SIEMENS VVP47.10-1.6, 2-WAY VALVE	10	Un.				13/10/2018		
9		CIM QA00201015 1/2" BALL VALVE MAKE CIM TYPE 314	46	Un.				13/10/2018		
10		CIM QD35101015 1/2" BALL VALVE MAKE W/STRAINER MAKE CIM TYPE 620	46	Un.				13/10/2018		
11		Flamco 27750 3/8" AUTOMATIC AIR RELEASE	46	Un.				13/10/2018		
12		Viega 04.2244-222 18mm-1/2" ADAPTOR	46	Un.				13/10/2018		
13		Viega 04.2002-018 18mm FEMALE ELBOW	46	Un.				13/10/2018		
14		Viega 04.2001-018 18mm MALE/FEMALE ELBOW	46	Un.				13/10/2018		
15		VSH 04.4060-222 1/2"-18mm COMPRESSION ADAPT	46	Un.				13/10/2018		
16		18mm COPPER PIPE UNE EN 1057	100	m				13/10/2018		
17		IMI 50 004-115 1/2" TA-TRIM 'A'	46	Un.				13/10/2018		
18		Isiflo 04.8241-125 1/2"-1/4" BUSHING REDUCER	46	Un.				13/10/2018		
19		Viega 04.2274-222 18-1/2" ADAPTOR	46	Un.				13/10/2018		
20		Tuerca de reducción 1/2"x3/8"	46	Un.				13/10/2018		
21		GF 00.0280-104 1/2" HAXAGON NIPPLE	46	Un.				13/10/2018		
22		Viega 04.2130.018 18mm TEE	46	Un.				13/10/2018		
23		Viega 04 2091 222 18-1/2"	46	Un.				13/10/2018		
24		KUHN controls AG Relays C10-A1x	46	Un.				13/10/2018		
25		KUHN controls AG Relays C9-A4x	46	Un.				13/10/2018		
26		Socket for relay RELECO QRC series S9-M	46	Un.				13/10/2018		
27		Socket for relay RELECO IRC series S10-M	46	Un.				13/10/2018		
28		Siemens Electrical actuator SSP61, 24V AC/ DC, 0-10V DC control signal	46	Un.				13/10/2018		
29		TUFVASSONS PVS 48 Ref. 6024-0009 Transformer	46	Un.				13/10/2018		
30		CIM QA00201015 1/2" BALL VALVE MAKE CIM TYPE 314	10	Un.				13/10/2018		
31		CIM QD35101015 1/2" BALL VALVE MAKE W/STRAINER MAKE CIM TYPE 620	10	Un.				13/10/2018		
32		Flamco 27750 3/8" AUTOMATIC AIR RELEASE	10	Un.				13/10/2018		
33		Viega 04.2244-263 22mm-1/2" ADAPTOR	10	Un.				13/10/2018		
34		Viega 04.2002-022 22mm FEMALE ELBOW	10	Un.				13/10/2018		
35		Viega 04.2001-022 22mm MALE/FEMALE ELBOW	10	Un.				13/10/2018		
36		VSH 04.4060-263 1/2"-22mm COMPRESSION ADAPT	10	Un.				13/10/2018		
37		22mm COPPER PIPE UNE EN 1057	25	m				13/10/2018		
38		IMI 50 004-115 1/2" TA-TRIM 'A'	10	Un.				13/10/2018		
39		Isiflo 04.8241-125 1/2"-1/4" BUSHING REDUCER	10	Un.				13/10/2018		
40		Viega 04.2274-263 22-1/2" ADAPTOR	10	Un.				13/10/2018		
41		Tuerca de reducción 1/2"x3/8"	10	Un.				13/10/2018		
42		GF 00.0280-104 1/2" HAXAGON NIPPLE	10	Un.				13/10/2018		
43		Viega 04.2130.022 22mm TEE	10	Un.				13/10/2018		
44		Viega 04 2091 022 22-3/4"	10	Un.				13/10/2018		
45		Tuerca de reducción 3/4"x1/2"	10	Un.				13/10/2018		
46		KUHN controls AG Relays C10-A1x	10	Un.				13/10/2018		

Requisição interna de material e equipamento

Codg. Destinatário (PEP/CC)		GIOB/00GI-PT05	Nº Rim : 1400_GI-0123 - FSC & CPCC - Chilled water							
Para		Lista Compras	Local entrega: Europort					Datas		
C/C			15/09/2018							
Item N.º	Código SAP	Descrição material ou equipamento	Quant	Uni	Preço unit. Seco	Preço total	Observações	Data necessidade	Data saída (apenas para equipamentos)	Data Chegada
47		KUHN controls AG Relays C9-A4x	10	Un.				13/10/2018		
48		Socket foR relay RELECO QRC series S9-M	10	Un.				13/10/2018		
49		Socket foR relay RELECO IRC series S10-M	10	Un.				13/10/2018		
50		Siemens Electrical actuator SSP61, 24V AC/ DC, 0-10V DC control signal	10	Un.				13/10/2018		
51		TUFVASSONS PVS 48 Ref. 6024-0009 Transformer	10	Un.				13/10/2018		
52		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 2 1/2"	25	m				13/10/2018		
53		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 2"	100	m				13/10/2018		
54		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 1 1/2"	50	m				13/10/2018		
55		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 1 1/4"	200	m				13/10/2018		
56		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 1"	110	m				13/10/2018		
57		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 3/4"	35	m				13/10/2018		
58		Galvanised Steel Pipe seamless for threaded - DIN 2440 - 1/2"	15	m				13/10/2018		
59		Galvanised Steel - DIN 2440 - MANGUITO 2 1/2"	10	Un.				13/10/2018		
60		Galvanised Steel - DIN 2440 - MANGUITO 2"	25	Un.				13/10/2018		
61		Galvanised Steel - DIN 2440 - MANGUITO 1 1/2"	15	Un.				13/10/2018		
62		Galvanised Steel - DIN 2440 - MANGUITO 1 1/4"	50	Un.				13/10/2018		
63		Galvanised Steel - DIN 2440 - MANGUITO 1"	30	Un.				13/10/2018		
64		Galvanised Steel - DIN 2440 - MANGUITO 3/4"	10	Un.				13/10/2018		
65		Galvanised Steel - DIN 2440 - MANGUITO 1/2"	5	Un.				13/10/2018		
66		Galvanised Steel - DIN 2440 - CODO 90º 2 1/2"	20	Un.				13/10/2018		
67		Galvanised Steel - DIN 2440 - CODO 90º 2"	35	Un.				13/10/2018		
68		Galvanised Steel - DIN 2440 - CODO 90º 1 1/2"	20	Un.				13/10/2018		
69		Galvanised Steel - DIN 2440 - CODO 90º 1 1/4"	70	Un.				13/10/2018		
70		Galvanised Steel - DIN 2440 - CODO 90º 1"	35	Un.				13/10/2018		
71		Galvanised Steel - DIN 2440 - CODO 45º 3/4"	10	Un.				13/10/2018		
72		Galvanised Steel - DIN 2440 - CODO 45º 1/2"	5	Un.				13/10/2018		
73		Galvanised Steel - DIN 2440 - T 2 1/2"	20	Un.				13/10/2018		
74		Galvanised Steel - DIN 2440 - T 2"	55	Un.				13/10/2018		
75		Galvanised Steel - DIN 2440 - T 1 1/2"	15	Un.				13/10/2018		
76		Galvanised Steel - DIN 2440 - T 1 1/4"	135	Un.				13/10/2018		
77		Galvanised Steel - DIN 2440 - T 1"	55	Un.				13/10/2018		
78		Galvanised Steel - DIN 2440 - REDUCCIÓN 2"x2 1/2"	10	Un.				13/10/2018		
79		Galvanised Steel - DIN 2440 - REDUCCIÓN 2"x1 1/2"	15	Un.				13/10/2018		
80		Galvanised Steel - DIN 2440 - REDUCCIÓN 2"x1 1/4"	15	Un.				13/10/2018		
81		Galvanised Steel - DIN 2440 - REDUCCIÓN 1 1/2" x 1"	15	Un.				13/10/2018		
82		Galvanised Steel - DIN 2440 - REDUCCIÓN 1 1/4" x 1"	15	Un.				13/10/2018		
83		Galvanised Steel - DIN 2440 - REDUCCIÓN 1 1/2"x3/4"	45	Un.				13/10/2018		
84		Galvanised Steel - DIN 2440 - REDUCCIÓN 1 1/4"x3/4"	35	Un.				13/10/2018		
85		Galvanised Steel - DIN 2440 - REDUCCIÓN 1"x3/4"	45	Un.				13/10/2018		
86		Galvanised Steel - DIN 2440 - MACHON 3/4"	50	Un.				13/10/2018		
87		Galvanised Steel - DIN 2440 - MACHON 1/2"	65	Un.				13/10/2018		
88		Insulation Kaiflex KKplus s4 SK-T 18mm	100	m				13/10/2018		
89		Insulation Kaiflex KKplus s4 SK-T 22mm	50	m				13/10/2018		
90		Insulation Kaiflex KKplus s4 SK-T 76mm	25	m				13/10/2018		
91		Insulation Kaiflex KKplus s4 SK-T 60mm	100	m				13/10/2018		
92		Insulation Kaiflex KKplus s4 SK-T 48mm	50	m				13/10/2018		

Requisição interna de material e equipamento										
Codg. Destinatário (PEP/CC)		GIOB/00GI-PT05	Nº Rim : 1400_GI-0123 - FSC & CPCC - Chilled water							
Para		Lista Compras	Local entrega: Europort					Datas		
C/C			15/09/2018							
Item N.º	Código SAP	Descrição material ou equipamento	Quant	Uni	Preço unit. Seco	Preço total	Observações	Data necessidade	Data saída (apenas para equipamentos)	Data Chegada
93		Insulation Kaiflex KKplus s4 SK-T 42mm	200	m				13/10/2018		
94		Insulation Kaiflex KKplus s4 SK-T 35mm	110	m				13/10/2018		
95		Insulation Kaiflex KKplus s4 SK-T 28mm	35	m				13/10/2018		
96		Insulation Kaiflex KKplus s4 SK-T 22mm	15	m				13/10/2018		
97		Aislamiento de abrazadera Kaiflex RT-ST-19x76	40	Un.				13/10/2018		
98		Aislamiento de abrazadera Kaiflex RT-ST-19x60	190	Un.				13/10/2018		
99		Aislamiento de abrazadera Kaiflex RT-ST-19x48	100	Un.				13/10/2018		
100		Aislamiento de abrazadera Kaiflex RT-ST-19x42	370	Un.				13/10/2018		
101		Aislamiento de abrazadera Kaiflex RT-ST-19x35	210	Un.				13/10/2018		
102		Aislamiento de abrazadera Kaiflex RT-ST-19x28	65	Un.				13/10/2018		
103		Aislamiento de abrazadera Kaiflex RT-ST-19x22	25	Un.				13/10/2018		
104		Abrazadera walraven 330 3 118	40	Un.				13/10/2018		
105		Abrazadera walraven 330 3 105	190	Un.				13/10/2018		
106		Abrazadera walraven 330 3 089	100	Un.				13/10/2018		
107		Abrazadera walraven 330 3 085	370	Un.				13/10/2018		
108		Abrazadera walraven 330 3 076	210	Un.				13/10/2018		
109		Abrazadera walraven 300 8 070	65	Un.				13/10/2018		
110		Abrazadera walraven 330 3 064	25	Un.				13/10/2018		
111		VARILLA ROSCADA M-8	2500	m				13/10/2018		
112		Manguitos roscados M8	1000	Un.				13/10/2018		
113		TUERCA M-8	2500	Un.				13/10/2018		
114		ARANDELA ALA ANCHA M-8	2500	Un.				13/10/2018		
115		TACO METALICO ANCLAJE VARILLA ROSCADA M-8	2500	Un.				13/10/2018		

Requisição interna de material e equipamento										
Codg. Destinatário (PEP/CC)		GIOB/00GI-PT05	Nº Rim : 1423_GI-PT05							
Para		Lista Compras	Local entrega: EUROPORT					Datas		
C/C		ME	25/10/2018							
Item N.º	Código SAP	Descrição material ou equipamento	Quant	Uni	Preço unit. Seco	Preço total	Observações	Data necessidade	Data saída (apenas para equipamentos)	Data Chegada
1		Square Diffuser , model LCP-125-1 - Manufacturer Lindab	25,00	uni				13/01/2019		
2		Square Diffuser , model LCP-160-1 - Manufacturer Lindab	15,00	uni				13/01/2019		
3		Square Diffuser , model LCP-200-1 - Manufacturer Lindab	5,00	uni				13/01/2019		
4		Square Diffuser , model LCP-315-1 - Manufacturer Lindab	3,00	uni				13/01/2019		
5										
6										
7										
8										
9										
10										
11										

Requisição interna de material e equipamento										
Codg. Destinatário (PEP/CC)		GIOB/00GI-PT05	Nº Rim : 1458_GI-0123 - PCC -							
Para		Lista Compras	Local entrega: Europort					Datas		
C/C			28/09/2018							
Item N.º	Código SAP	Descrição material ou equipamento	Quant	Uni	Preço unit. Seco	Preço total	Observações	Data necessidade	Data saída (apenas para equipamentos)	Data Chegada
		Fan Coils units PCC - Marca TROX					Datasheet em anexo			
1		PWX-60/1-F7-R-4-0-T15-25A-23-S-0-P2-0-0 Fan Coil Unit + RDG160T Siemens Controller	70	Uni			Encomenda só depois da minha aprovação	12/11/2018		
2		PWX-90/1-F7-R-4-0-T15-25A-23-S-0-P2-0-0 Fan Coil Unit + RDG160T Siemens Controller	5	Uni			Encomenda só depois da minha aprovação	12/11/2018		
3		PWX-90/2-F7-R-4-0-T15-25A-23-S-0-P2-0-0 Fan Coil Unit + RDG160T Siemens Controller	3	Uni			Encomenda só depois da minha aprovação	12/11/2018		
4		PWX-120/2-F7-R-4-0-T15-25A-23-S-0-P2-0-0 Fan Coil Unit + RDG160T Siemens Controller	1	Uni			Encomenda só depois da minha aprovação	12/11/2018		
5										
6		Fixed Orifice Double Regulating Valve (FODRV), Marca CRANE, modelo D931, DN15	158	Uni			Datasheet em anexo	12/11/2018		
7										
8										
9										
10										
11										
12										

Requisição interna de material e equipamento										
Codg. Destinatário (PEP/CC)		GIOB/00GI-PT05	Nº Rim : 1530_GI-PT05							
Para		Lista Compras	Local entrega: EUROPORT					Datas		
C/C		ME	28/11/2018							
Item N.º	Código SAP	Descrição material ou equipamento	Quant	Uni	Preço unit. Seco	Preço total	Observações	Data necessidade	Data saída (apenas para equipamentos)	Data Chegada
1		Air handling unit CPCC AHU-1 - FLAKT eQ 023 - Manufacturer "Flaktgroup"	1	Uni			Orçamento e Especificações em anexo	28/01/2019		
2		Kit Hidráulico	1	cj			Orçamento e Especificações em anexo	28/01/2019		
3										
4										
5										
6										
7										
8										
9										

ATA DE REUNIÃO

Europort

Reunião de 19/02/2019 – Gibraltar

Presenças (abreviaturas)	Rúbricas
Nuno Santos (NS)	
Paulo Nogueira (PN)	
(abreviaturas)	
CE	Engenheiro Carlos Esteves
BS	Bruno Silva
CP	Compras
ME	Miguel Esteves

Nº	Informações
1	Próxima reunião: 26/02/2019 às 15:00 – Local: Sala de reuniões em Obra

Nº	Assunto (ação)	Responsável	Prazo
1	<u>Datas de entrega da Obra</u> - CPCC : Data contratual: 19/04/2019 Produzidos 85% - FSC: (Refurbishment) Data contratual: 27/02/2019 Produzidos 70% - PCC: Data contratual: 14/06/2019 Produzidos 5%	HIDRO	28/02/2019
2	<u>Planeamento</u> - FSC (Refurbishment) - Fim dos Trabahos 28/02/2019 - CPCC - Preparação para conclusão da promada – - Preparação para UTA – - Incio trabalhos Dentistas – 26/02/2019 - PCC - Inicio Trabalhos 2ª Floor – 26/02/2019	NS/PN NS/PN PN PN	22/02/2019 05/03/2019 26/02/2019 26/02/2019

Europaort

Reunião de 19/02/2019 – Gibraltar

3	<u>HVAC/hidráulica</u>		
	▪ <u>Geral</u>		
	Orçamentos: ▪ New chilled water supply – Aprovado ▪ Server room CPCC – Aprovado ▪ Server room PCC – Aguardar Aprovação ▪ Dry Riser – Aguardar Aprovação ▪ Dental Clinical Services - Aguardar Aprovação	CE CE CE	
	<u>Projeto de CPCC:</u>		
	▪ Abastecimento (Retificações) ▪ Chilled Water (Retificações) ▪ Ventilação (Retificações) ▪ Condensados (Retificações) ▪ Águas residuais (Falta preparação ala superior) ▪ Águas chuvas - (Retificações) ▪ UTA na cobertura(Aprovado c/ alterações a fazer) ▪ Comissioning Set (Espera de aprovação de Lars) ▪	NS/BS NS/BS NS/BS NS/BS PN NS/BS NS/BS Lars	22/02/2019
	<u>Projeto PCC:</u>		
	▪ Abastecimento (Ver comentários de 18/01/2019) ▪ Heating (Ver comentários de 18/01/2019) ▪ Chilled Water (Espera de aprovação de Lars) ▪ Chilled Water on Basement (data inicial: 15/01/2019) ▪ Ventilação (Ver comentários de 18/01/2019) ▪ Águas Residuais (Ver comentários de 18/01/2019) ▪ Condensados (Ver comentários de 18/01/2019) ▪ UTA na cobertura (Espera de aprovação de Lars) ▪ Comissioning Set (Espera de aprovação de Lars) ▪	NS NS NS NS NS NS NS Lars Lars	26/02/2019 26/02/2019
	▪ FSC (Extension) ▪ Operation and Maintenance Manual ▪	NS	21/02/2019
	▪ FSC (Refurbishment)		
	Materiais em falta: ▪ Relés – Fornecer 9 Kit´s ao Fran ▪ ▪ ▪	PN	25//02 ou 26/02

Europaort

Reunião de 19/02/2019 – Gibraltar

<u>Trabalhos:</u> ▪ Fan coil units – Novas + Existentes - Acabar ▪ Tubagem galvanizada - Acabar ▪ Drenos - Acabar ▪ Comandos (ligações eléctricas) ▪ CPCC Amostra de abastecimento e Drenagem de Lavatórios. (Aprovado) <u>Materiais em falta:</u> ▪ Transformadores (10 em falta) – ▪ UTA - ▪ Comissioning Set –(falta long brass male nipple) ▪ Grelhas ventilação (18 em falta) ▪ MultiCamada (água Salgada) ▪ Conduta fecho promada (encomendar) ▪ <u>Dentistas:</u> ▪ Cobre ▪ Multicamada ▪ PVC-U ▪ AGSS TU (Falta 1) ▪ Isolamento ▪ <u>Trabalhos:</u> ▪ Tubo galvanizado - 95% feito ▪ Condutas de ventilação - 90% feito ▪ Condutas de ventilação de prumada - 80% feito ▪ Fan Coil Units + controllers – (inicio de ligações) ▪ UTA (preparação) ▪ Abastecimento de água - 75% feito ▪ Drenagem condensados - 90% feito ▪ Drenagem águas residuais – 85% feito ▪ Válvulas água Salgada (Amostra Lars)	PN PN PN PN	22/02/2019 22/02/2019 22/02/2019 28/02/2019
	CP	22/02/2019
	CP	01/04/2019
	CP	26/02/2019
	CP	22/02/2019
	CP	04/03/2019
	PN/NS	22/02/2019
	CP	26/02/2019
	CP	26/02/2019
	CP	26/02/2019
	CE	26/02/2019
	CP	04/03/2019
	NS/CE	13/02/2019

Europaort

Reunião de 19/02/2019 – Gibraltar

▪ PCC Planeamento de ligação do chilled water no basement. Ver de materiais + especialista montagem + especialista de isolamento alumínio – <u>Entrega de materiais</u> ▪ Galvanizado – +/- 30% em falta ▪ Conduatas ventilação – Entrega final ▪ Conduatas ventilação ligação Hospital - Entrega ▪ Fan Coil Units + controllers – ▪ UTA – Importante ▪ Tubagem abastecimento de água ▪ Material para ligação basement (Levantamento Tubagem de 4") ▪ Coluna Seca ▪ <u>Trabalhos:</u> ▪ Geberit Pluvia – (Inicio) ▪ Coluna Seca - (Aguardar chegada do restante material) ▪ <u>2ª Floor</u> ▪ Tubo galvanizado – % feito ▪ Conduatas de ventilação - % feito ▪ Drenagem - % feito ▪ Fan Coils + commandos - % feito ▪ Comissioning Set - % feito ▪ ▪ <u>1ª Floor</u> ▪ Tubo galvanizado – % feito ▪ Conduatas de ventilação - % feito ▪ Drenagem - % feito ▪ Fan Coils + commandos - % feito ▪ Comissioning Set - % feito ▪	PN/NS/ME CP CP CP CP CP NS/PN CP PN PN	26/02/2019 22/02/2019 04/03/2019 29/04/2019 04/03/2019 27/02/2019 26/02/2019 26/02/2019 26/02/2019
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ATA DE REUNIÃO Europort

Reunião de 19/02/2019 – Gibraltar

	▪ <u>Ground Floor</u> ▪ Tubo galvanizado – % feito ▪ Conduas de ventilação - % feito ▪ Drenagem - 60 % feito ▪ Fan Coils + comandos - % feito ▪ Comissioning Set - % feito ▪ <u>Outros</u> ▪ Carotes PCC – Basement ▪ <u>PTS missing:</u> ▪ Comissioning Set PCC – Heating ▪ Comissioning Set PCC – Cool ▪ Bomba e inversor ▪ ▪ <u>Ensaio</u> ▪ Conduas Spiro CPCC – (Resultados) ▪ Condensados - (Resultados) ▪ Tubagem Galvanizado - (Resultados) ▪ Multicamada - (Resultados) ▪ Drenagem - (Resultados)	CE N N N PN PN PN PN PN	06/03/2019 22/02/2019 22/02/2019 22/02/2019 22/02/2019 22/02/2019 27/02/2019
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Org. Vendas	Casais Gibraltar (Hidro)
Cód. Cliente	CASAS GIBRALTAR LIMITED
Nome Cliente	GI-PT05 - GIOB0123 - Europort
Obra	Europort
Abreviatura	Trabalhos Normais - Preço Global
Item	
Documento	Libras Estrelinas
Moeda	Dezembro 2018 - Auto 4
Texto Auto	

isável pelo emp: _____ / /

ado pela fiscal: _____ / /

Total	Total	Total	Total	Total

Obra: Europort - FSC
Cliente: Casais Gibraltar

Tipo: Instalações Hidraulicas e de AVAC
A/C:

Orç. N.º: 2017 026 L ME Europort		Data: dez/18						Acumulado no último mês		Este mês		Acumulado		Saldo	
POS.	DESIGNATION	UC	QT	PREÇO UNIT. MAT	PREÇO UNIT. MO	PREÇO UNIT. TOTAL	TOTAL	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade a Faturar	Valor Total a Faturar
1	FSC - HYDRAULICS														
1.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.														
1.1.1	DN40	m	60					60,00				60,00			
1.1.2	DN63	m	30					30,00				30,00			
1.2	Foul water drainage														
1.2.1	DN40	m	12											12,00	131,76
1.3	Rain water drainage														
1.3.1	DN110	m	50					50,00				50,00			
1.4	Water supply MULTILAYER piping with insulation on hot water supply and penny valves														
1.4.1	25mm	m	30											30,00	640,80
1.4.2	16 mm	m	40											40,00	627,60
1.4.3	Thermostatic mixing valve	un	2											2,00	264,14
1.5	Geberit Pluvia system	Gv	1					1,00				1,00			
1.6	Sanitary ware installation including silicone, excluding siphons and supports.	un	1											1,00	38,43
1.7	Taps supports excluding eventual accessories.	un	1											1,00	6,47
1.8	Water heaters and accessories installation including rigid piping	un	2											2,00	194,04
1	FSC - HVAC														
1.1	Flakt Woods new cassette type fan coil units with individual temperature controller. Units with one water coil and one electrical resistance. Siemens individual modulant 2 way valve, Flakt Woods controllers and Kuhn relays, automatic air release valve, TA trim valve, strainer and two ball valves. Connection to the galvanized chilled water piping by soft copper pipping with TA couplings. The electrical resistance control shall be on/off type.														
1.1.1	(QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9010 Grille + STRA-07 Controller)	un	9					8,00		1,00		9,00			
1.1.2	Connection Kit for cassettes	un	9					8,00		1,00		9,00			
1.1.3	Power supply to the fan coil units	un	9					9,00				9,00			
1.2	Existing cassette type fan coil units with individual temperature controller, installation. Europort will supply the fan coil unit, Siemens individual modulant 2 way valve, Flakt Woods controllers and Kuhn relays, automatic air release valve, TA trim valve, strainer and two ball valves. Connection to the galvanized chilled water piping by soft copper pipping with TA couplings. The electrical resistance control shall be on/off type. Per fan coil unit an individual wall control panel is foreseen to be also supplied by Europort.														
1.2.1	FCU (04L Model)	un	4											4,00	729,52
1.2.2	Power supply to the fan coil units	un	4											4,00	74,44
1.2.3	Fan coil units relocation	un	5											5,00	1 720,40
1.4	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.														
1.4.1	2"	m	50					50,00				50,00			
1.4.2	1 1/2"	m	40					40,00				40,00			
1.4.3	1 1/4"	m	50					50,00				50,00			
1.4.4	1"	m	50					50,00				50,00			
1.4.5	3/4"	m	10					10,00				10,00			

Ora. Vendas	Casais Gibraltar (Hidro)
Cód. Cliente	
Nome Cliente	CASAIS GIBRALTAR LIMITED
Obra	
Abreviatura	GI-PT05 - GIOB0123 - Europort
Item	Europort
Documento	Trabalhos Normais - Preço Global
Moeda	Libras Estrelinas
Texto Auto	DEZEMBRO 2018 - JULIO 4

Obra: Europort - CPCC
Cliente: Casais Gibraltar

Tipo: Instalações Hidráulicas e de AVAC
A/C:

Responsável pelo empreiteiro: _____ / /

Aprovado pela
fiscalização: _____ / /

Total

Total

Total

Total

Total

Orç. N.º: 2017 026 L ME Europort				Data: dez/18				Acumulado no último mês		Este mês		Acumulado		Saldos	
POS.	DESIGNATION	UC	QT	PREÇO UNIT. MAT	PREÇO UNIT. MO	PREÇO UNIT. TOTAL	TOTAL	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade a Faturar	Valor Total a Faturar
2	CPCC - HYDRAULICS														
2.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kaiflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.														
2.1.1	DN40	m	181					181,00				181,00			-0,01
2.1.2	DN63	m	143					143,00				143,00			-9,01
2.2	Foul water drainage														
2.2.1	DN40	m	60					40,00		20,00		60,00			
2.2.2	DN90	m	155					135,00		20,00		155,00			
2.3	Rain water drainage														
2.3.1	DN110	m	50					50,00				50,00			
2.3.2	DN160	m	9					9,00				9,00			
2.4	Water supply MULTILAYER piping with insulation on hot water supply and penrv valves														
2.4.1	25mm	m	90					78,00		7,00		85,00		5,00	106,80
2.4.2	16 mm	m	210					180,00		15,00		195,00		15,00	235,35
2.4.3	Thermostatic mixing valve	un	30					15,00				15,00		15,00	1.941,05
2.5	Sanitary ware installation including silicone, excluding siphons and supports.	un	35											35,00	1.345,05
2.6	Taps supports excluding eventual accessories.	un	29											29,00	187,63
2.7	Water heaters and accessories installation including rigid piping	un	27											27,00	2.619,54
2	CPCC - HVAC														
2.1	Air Handling Unit AHU.1 (Located on level 07, Plant Room)	un	1											1,00	35.244,59
2.2	Toilet extract fan TEF.01 (Located on level 07, Plant Room)	un	1											1,00	
2.3	Fan Coil Units Flakt Woods brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.														
2.3.1	QFDK-20-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	un	11											11,00	9.896,57
2.3.2	QFDK-10-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	un	31											31,00	27.141,74
2.3.3	QFDK-50-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	un	1											1,00	1.386,35
2.3.4	QFDK-30-0-2-1-1 Unit + QFDZ-15-06 RAL9003 Grille + STRA-07 Controller	un	2											2,00	1.970,00
2.3.5	Connection Kit for cassettes	un	45					10,00				10,00		35,00	20.027,75
2.3.6	Power supply to the fan coil units	m	45					40,00				40,00		5,00	111,30
2.4	Mitsubishi Mono-Split System including individual remote wall mounted temperature controller, with return air temperature sensor. Each unit to come complete with integral condensate pump.														
2.4.1	FCU 0.44 Indoor Units - PKA-M60HA - OUTDOOR - PUHZ-ZRP60VKA2 + PAR-30MAA Controller and with condensate pump	un	2											2,00	5.950,48
2.4.2	Mechanical connections between indoor and outdoor units	m	60											60,00	2.577,60
2.4.3	Power supply to the fan coil units	m	5											5,00	85,05
2.5	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.														



Ora. Vendas	Casais Gibraltar (Hidro)
Cód. Cliente	CASAIS GIBRALTAR LIMITED
Nome Cliente	
Obra	
Abreviatura	GI-PT05 - GIOB0123 - Europort
Item	Europort
Documento	Trabalhos Normais - Preço Global
Moeda	Libras Estrelinas
Texto Auto	DEZEMBRO 2015 - Julho 4

Obra: Europort - CPCC
Cliente: Casais Gibraltar

Tipo: Instalações Hidráulicas e de AVAC
A/C:

Responsável pelo empreiteiro: _____ / /

Aprovado pela
fiscalização: _____ / /

Total

Total

Total

Total

Total

Orç. N.º: 2017 026 L ME Europort				Data: dez/18				Acumulado no último mês		Este mês		Acumulado		Saldos	
POS.	DESIGNATION	UC	QT	PREÇO UNIT. MAT	PREÇO UNIT. MO	PREÇO UNIT. TOTAL	TOTAL	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade a Faturar	Valor Total a Faturar
2.5.1	2 1/2"	un	25					20,00				20,00		5,00	661,45
2.5.2	2"	un	50					40,00		5,00		45,00		5,00	391,20
2.5.3	1 1/2"	un	10					10,00				10,00			
2.5.4	1 1/4"	un	150					130,00		15,00		145,00		5,00	278,35
2.5.5	1"	un	60					50,00		5,00		55,00		5,00	298,25
2.5.6	3/4"	un	25					25,00				25,00			
2.5.7	1/2"	un	15					15,00				15,00			
2.6	Ventilation														
2.6.1	Dampers														
2.6.1.1	Fire Dampers Ø 125	un	5					2,00		3,00		5,00			
2.6.1.2	Fire Dampers 500x400	un	2					2,00				2,00			
2.6.1.3	VCD - Volume Control Damper 500x400	un	2					2,00				2,00			
2.6.1.4	VCD - Volume Control Damper 350x300	un	2					2,00				2,00			
2.6.1.5	VCD - Volume Control Damper Ø 125	un	50					50,00				50,00			
2.6.1.6	VCD - Volume Control Damper Ø 160	un	38					38,00				38,00			
2.6.1.7	VCD - Volume Control Damper Ø 200	un	11					11,00				11,00			
2.6.1.8	VCD - Volume Control Damper Ø 250	un	6					6,00				6,00			
2.6.1.9	VCD - Volume Control Damper Ø 315	un	6					6,00				6,00			
2.6.2	Extraction and supply ducts insulated	va	1					0,90		0,05		0,95		0,05	694,90
2.6.3	Extract Grille														
2.6.3.1	Square Extract Grille, model PCY Size 600	un	74											74,00	5.697,60
2.6.4	Supply Grille and flexible duct														
2.6.4.1	Square Diffuser , model LCP-125-1	un	25											25,00	
2.6.4.2	Square Diffuser , model LCP-160-1	un	15											15,00	3.045,75
2.6.4.3	Square Diffuser , model LCP-200-1	un	5											5,00	1.015,25
2.6.4.4	Square Diffuser , model LCP-315-1	un	3											3,00	699,15

Org. Vendas	Casais Gibraltar (Hidro)
Cód. Cliente	
Nome Cliente	CASAIS GIBALTAR LIMITED
Obra	GI-PT05 - GIOB0123 - Europort
Abreviatura	Europort
Item	Trabalhos Normais - Preço Global
Documento	
Moeda	Libras Estrelinas
Texto Auto	Dezembro 2018 - Auto 4

Obra: Europort - PCC
 Cliente: Casais Gibraltar

Tipo: Instalações Hidraulicas e de AVAC
 A/C:

responsável pelo emprei

autorizado pela fiscalizaç

Total

Total

Total

Total

Total

Orç. N.º: 2017 026 L ME Europort								Data: dez/18		Acumulado no último mês		Este mês		Acumulado		SalDOS		a	l
POS.	DESIGNATION	UC	QT	PREÇO UNIT. MAT	PREÇO UNIT. MO	PREÇO UNIT. TOTAL	TOTAL	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade a Faturar	Valor Total a Faturar				
3	PCC- HYDRAULICS																		
	LEVEL 0																		
3.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kafflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.																		
3.1.1	DN40	m	150												150,00				
3.1.2	DN63	m	40												40,00				
3.2	Foul water drainage																		
3.2.1	DN32	m	70												70,00				
3.2.2	DN40	m	50					30,00				30,00			20,00				
3.2.3	DN75	m	100												100,00				
3.2.4	DN110	m	60					50,00				50,00			10,00				
3.3	Water supply MULTILAYER piping with insulation on hot water supply and penny valves																		
3.3.1	32mm	m	40												40,00				
3.3.2	25mm	m	68												68,00				
3.3.3	20mm	m	100												100,00				
3.3.4	16 mm	m	465												465,00				
3.3.5	Thermostatic mixing valve	un	26												26,00				
3.4	Sanitary ware installation including silicone, excluding siphons and supports.	un	26												26,00				
3.5	Taps supports excluding eventual accessories.	un	26												26,00				
	LEVEL 1																		
4.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kafflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.																		
4.1.1	DN40	m	150												150,00				
4.1.2	DN63	m	40												40,00				
4.2	Foul water drainage																		
4.2.1	DN32	m	70												70,00				
4.2.2	DN40	m	50												50,00				
4.2.3	DN75	m	100												100,00				
4.2.4	DN110	m	60												60,00				
4.3	Water supply MULTILAYER piping with insulation on hot water supply and penny valves																		
4.3.1	32mm	m	5												5,00				
4.3.2	25mm	m	50												50,00				
4.3.3	20mm	m	80												80,00				
4.3.4	16 mm	m	500												500,00				
4.3.5	Thermostatic mixing valve	un	24												24,00				
4.4	Sanitary ware installation including silicone, excluding siphons and supports.	un	25												25,00				
4.5	Taps supports excluding eventual accessories.	un	23												23,00				
	LEVEL 2																		
5.1	Condensate drainage in Pressure PVC according to EN1452-1 including Kafflex insulation and insulated clamps. The clamps height shall be adjustable. Each fan-coil unit shall have it's own siphon.																		
5.1.1	DN40	m	150												150,00				
5.1.2	DN63	m	40												40,00				
5.2	Foul water drainage																		
5.2.1	DN32	m	70												70,00				
5.2.2	DN40	m	50												50,00				
5.2.3	DN75	m	100												100,00				
5.2.4	DN110	m	60												60,00				
5.3	Water supply MULTILAYER piping with insulation on hot water supply and penny valves																		
5.3.1	32mm	m	8												8,00				
5.3.2	25mm	m	50												50,00				
5.3.3	20mm	m	80												80,00				

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POS.	DESIGNATION	UC	QT	PREÇO UNIT. MAT	PREÇO UNIT. MO	PREÇO UNIT. TOTAL	TOTAL	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade a Faturar	Valor Total a Faturar			
5.3.4	16 mm	m	270											270,00				
5.3.5	Thermostatic mixing valve	un	16											16,00				
5.4	Geberit Pluvia system	Gv	1					0,80				0,80		0,20				
5.5	Sanitary ware installation including silicone, excluding siphons and supports.	un	15											15,00				
5.6	Taps supports excluding eventual accessories.	un	12											12,00				
3	PCC - HVAC																	
	ROOF																	
3.1	Air Handling Unit AHU.01 (Located on level 04, Plant Room)	Un	1											1,00				
3.2	Toilet extract fan TEF.01 (Located on level 04, Plant Room)	Un	1											1,00				
	LEVEL 0																	
3.3	Fan Coil Units Trox brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.																	
3.3.1	PWX-60/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	Un	27											27,00				
3.3.2	PWX-90/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	Un	1											1,00				
3.3.3	PWX-120/2-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	Un	1											1,00				
3.3.4	Connection Kit for fan coils units	Un	29											29,00				
3.3.5	Power supply to the fan coil units	m	29											29,00				
3.4	Mitsubishi Mono-Split System including individual remote wall mounted temperature controller, with return air temperature sensor. Each unit to come complete with integral condensate pump.																	
3.4.1	Indoor Units - PKA-M50HA , OUTDOOR - PUHZ-ZRP50VKA2t + PAR-30MAA Controller	gv	2											2,00				
3.4.2	Mechanical connections between indoor and outdoor units	m	30											30,00				
3.4.3	Power supply to the fan coil units	m	10											10,00				
3.5	Seamless galvanized steel pipework according to DIN2446 with threaded connections and galvanized accessories, including Kafflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.																	
3.5.1	2 1/2"	un	55											55,00				
3.5.2	2"	un	7											7,00				
3.5.3	1 1/4"	un	55											55,00				
3.5.4	1"	un	44											44,00				
3.5.5	3/4"	un	100											100,00				
3.5.6	1/2"	un	440											440,00				
3.6	Ventilation																	
3.6.1	Dampers																	
3.6.1.1	Fire Dampers Ø 100	un	5											5,00				
3.6.1.2	Fire Dampers Ø 160	un	48											48,00				
3.6.1.3	Fire Dampers Ø 200	un	4											4,00				
3.6.1.4	Fire Dampers Ø 250	un	3											3,00				
3.6.1.5	Fire Dampers 300X250	un	1											1,00				
3.6.1.6	Fire Dampers 350X300	un	1											1,00				
3.6.1.7	Fire Dampers 600X350	un	2											2,00				
3.6.1.8	Fire Dampers 600X400	un	2											2,00				
3.6.1.9	VCD - Volume Control Damper 600x400	un	2											2,00				
3.6.1.10	VCD - Volume Control Damper 600x350	un	2											2,00				
3.6.1.11	VCD - Volume Control Damper 350x300	un	1											1,00				
3.6.1.12	VCD - Volume Control Damper Ø 100	un	5											5,00				
3.6.1.13	VCD - Volume Control Damper Ø 160	un	56											56,00				
3.6.1.14	VCD - Volume Control Damper Ø 200	un	15											15,00				
3.6.1.15	VCD - Volume Control Damper Ø 250	un	20											20,00				
3.6.1.16	VCD - Volume Control Damper Ø 315	un	1											1,00				
3.6.2	Extraction and supply ducts insulated	vq	1											1,00				

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POS.	DESIGNATION	UC	QT	PREÇO UNIT. MAT	PREÇO UNIT. MO	PREÇO UNIT. TOTAL	TOTAL	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade Faturada	Valor Total Faturado	Quantidade a Faturar	Valor Total a Faturar	
3.6.3	Extract Grille																	
3.6.3.1	Square Extract Grille, model PCY Size 600	un	37													37,00		
3.6.4	Supply Grille and flexible duct																	
3.6.4.1	Square Diffuser, model LCP-125-1	un	2													2,00		
3.6.4.2	Square Diffuser, model LCP-160-1	un	9													9,00		
3.6.4.3	Square Diffuser, model LCP-200-1	un	6													6,00		
3.6.4.4	Square Diffuser, model LCP-250-1	un	73													73,00		
3.6.4.5	Square Diffuser, model LCP-315-1	un	6													6,00		
	LEVEL 1																	
3.7	Fan Coil Units Trox brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.																	
3.7.1	PWX-60/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	un	23													23,00		
3.7.2	PWX-90/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller, including plenum	un	2													2,00		
3.7.3	Connection Kit for cassettes	un	25													25,00		
3.7.4	Power supply to the fan coil units	un	25													25,00		
3.8	Seamless galvanized steel pipework according to DIN2440 with threaded connections and galvanized accessories, including Kaiflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.																	
3.8.1	2"	m	4													4,00		
3.8.2	1 1/2"	m	22													22,00		
3.8.3	1 1/4"	m	22													22,00		
3.8.4	1"	m	33													33,00		
3.8.5	3/4"	m	88													88,00		
3.8.6	1/2"	m	475													475,00		
3.9	Ventilation																	
3.9.1	Dampers																	
3.9.2	Fire Dampers Ø 160	Un	39													39,00		
3.9.3	Fire Dampers Ø 200	Un	9													9,00		
3.9.4	Fire Dampers 400x250	Un	1													1,00		
3.9.5	Fire Dampers 350x250	Un	1													1,00		
3.9.6	Fire Dampers 600x300	Un	2													2,00		
3.9.7	VCD - Volume Control Damper 600x300	Un	2													2,00		
3.9.8	VCD - Volume Control Damper Ø 160	Un	38													38,00		
3.9.9	VCD - Volume Control Damper Ø 200	Un	17													17,00		
3.9.10	VCD - Volume Control Damper Ø 250	Un	23													23,00		
3.9.10	Extraction and supply ducts insulated	qv	1													1,00		
3.9.11	Extract Grille																	
3.9.11.1	Square Extract Grille, model PCY Size 600	un	31													31,00		
3.9.12	Supply Grille																	
3.9.12.1	Square Diffuser, model LCP-250-1	un	26													26,00		
	LEVEL 2																	
3.9.13	Fan Coil Units Trox brand including individual remote wall mounted temperature controllers, with return air temperature sensor. Each unit to come complete with integral condensate pump.																	
3.9.13.1	PWX-60/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller	un	21													21,00		
3.9.13.2	PWX-90/1-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller	un	2													2,00		
3.9.13.3	PWX-90/2-F7-R-2-2-T15-25A-23-S-0-P1-0-0 Fan Coil Unit + RDG160T Siemens Controller	un	3													3,00		
3.9.13.4	Connection Kit for cassettes	un	26													26,00		
3.9.13.5	Power supply to the fan coil units	un	26													26,00		

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3.9.14	Seamless galvanized steel pipework according to DIN2446 with threaded connections and galvanized accessories, including Kafflex insulation and insulated clamps. Air release valves on high places. Supporting hardware. This network shall be connected to the existing installation on the FSC area.																		
3.9.14.1	2"	m	17													17,00			
3.9.14.2	1 1/2"	m	11													11,00			
3.9.14.3	1 1/4"	m	27													27,00			
3.9.14.4	1"	m	72													72,00			
3.9.14.5	3/4"	m	33													33,00			
3.9.14.6	1/2"	m	370													370,00			
3.9.15	Ventilation																		
3.9.15.1	Dampers																		
3.9.15.1.1	Fire Dampers Ø 160	un	26													26,00			
3.9.15.1.2	Fire Dampers Ø 200	un	20													20,00			
3.9.15.1.3	Fire Dampers Ø 250	un	1													1,00			
3.9.15.1.4	Fire Dampers 350x250	un	1													1,00			
3.9.15.1.5	Fire Dampers 400x300	un	2													2,00			
3.9.15.1.6	Fire Dampers 600x300	un	3													3,00			
3.9.15.1.7	Fire Dampers 700x700	un	4													4,00			
3.9.15.1.8	VCD - Volume Control Damper 700x700	un	2													2,00			
3.9.15.1.9	VCD - Volume Control Damper 600x400	un	2													2,00			
3.9.15.1.10	VCD - Volume Control Damper 600x300	un	3													3,00			
3.9.15.1.11	VCD - Volume Control Damper 400x300	un	4													4,00			
3.9.15.1.12	VCD - Volume Control Damper 350x250	un	1													1,00			
3.9.15.1.13	VCD - Volume Control Damper Ø 160	un	35													35,00			
3.9.15.1.14	VCD - Volume Control Damper Ø 200	un	35													35,00			
3.9.15.1.15	VCD - Volume Control Damper Ø 250	un	26													26,00			
3.9.15.2	Extraction and insufflation systems, consisting of insulated ducts and various insulated connection accessories	gv	1													1,00			
	Extract Grille																		
3.9.15.3	Square Extract Grille, model PCY Size 600	un	32													32,00			
3.9.15.4	Supply Grille																		
3.9.15.4.1	Square Diffuser , model LCP-125-1	un	1													1,00			
3.9.15.4.2	Square Diffuser , model LCP-160-1	un	1													1,00			
3.9.15.4.3	Square Diffuser , model LCP-200-1	un	6													6,00			
3.9.15.4.4	Square Diffuser , model LCP-250-1	un	23													23,00			
3.9.15.4.5	Square Diffuser , model LCP-200-3	un	3													3,00			
3.9.16	Static ventilators forsmoke vents including buttons and electrical installation without power supply.	un	3													3,00			
3.9.17	Static ventilators forsmoke vents including buttons and electrical installation without power supply.	un	1													1,00			

**EUROPORT – FSC
OPERATION AND MAINTENANCE MANUAL**

GENERAL INDEX

A – EQUIPMENT LIST

B – MANUFACTURERS LIST

C – EQUIPMENT MANUALS

D – SIMPLIFIED MAINTENANCE PLAN



**EUROPORT – FSC
OPERATION AND MAINTENANCE MANUAL**

EQUIPMENT LIST

**EUROPORT – FSC
OPERATION AND MAINTENANCE MANUAL**

MANUFACTURERS LIST

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EQUIPMENT – MANUALS

**EUROPORT – FSC
OPERATION AND MAINTENANCE MANUAL**

EQUIPMENT LIST MANUALS INDEX

- 01 – Fan Coils Units – Flaktgroup
- 02 - Copper pipe for chilled water & Insulation
- 03 - Galvanized steel & insulation
- 04 - Commissioning Set
- 05 - Electric Power Cable
- 06 - Controller Cable
- 07 - Rain and Foul drainage water piping
- 08 - PVC piping for condensate drainage
- 09 - Geberit Pluvia system



**EUROPORT – FSC
OPERATION AND MAINTENANCE MANUAL**

SIMPLIFIED MAINTENANCE MANUAL

PROJECT NAME	FAN COIL UNITS		
Europort - FSC Building			

Ref	Location	Drawing reference	Model <u>Flakt Woods</u>	Model <u>Sabiana Skystar</u>	QTY	Air flow Rate (l/s)
1	Open office	FCU01	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
2	Open office	FCU02	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
3	Open office	FCU03	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
4	Open office	FCU04	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
5	Open office	FCU05	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
6	Open office	FCU06	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
7	Open office	FCU07	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
8	Open office	FCU08	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
9	Open office	FCU09	QFDK-50-0-2-1-1 Unit + QFDZ-10-06 RAL9003 Grille + STRA-07 Controller	SK-52-E Unit + HT 800 RAL9003 Grille + STRA-07 Controller	1	416 l/s
10	Internal meeting room		04L		1	
11	internal meeting room		04L		1	
12	Meeting room		04L		1	
13	Meeting room		04L		1	



Work: Europort

Manufacturers HVAC

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Filters	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual		X				

Ducts diffusers elements and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Ducts						
Corrosion verification and insulation application.				X		
Internal inspection and cleaning.				X		
Flows check and compare with design.				X		
Fire dampers						
Working test.				X		
Check that damper stays open after inspection.				X		
Diffusion, return and air extraction air elements						
Surface cleaning with soft humid cloth				X		
Check airflows and compare with design.				X		

Hydraulic networks components and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Piping						
Brine leakage verification.	X					
Verification of corrosion, insulation, painting, supports and expansion joints.			X			
Air vents verification and filling of all branches.	X					
Valves						
Corrosion verification, joints and open and closure test.		X				
Elastic coupling						
Deformation inspection and brine leakages.	X					
Vessels						
Corrosion verification, insulation and inner cleaning.				X		
All valves working inspection.				X		
Calibrate manometers and thermometers.				X		
Closed expansion vessels						
Corrosion verification and inspect membrane.				X		
Leakages check, air pressure in chamber and safety valve.	X					
Compressor working verification.				X		
pressure switches and solenoid valves check.			X			
Water filters						
Brine leakages check and clean filter.					X	
Water flow meters						
Corrosion and brine leakage check. Metering register.	X					
Check working and measurement.					X	
Flow switches						
Corrosion check and brine leakage.	X					
Inner pipe cleaning.				X		
Electric contact tightening.				X		

Heat Exchangers	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Plate and dry coolers heat exchangers	X					
Check corrosion points, deformation, water leaks and cleaning.	X					
Thermal insulation state check.				X		
Opening, plate cleaning, substitution of damage plates and joints.				X		
Check tightness verification between primary and secondary circuit.		X				

Fan coils (internal units)	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Water and gas leaks check.	X					
Control systems check, thermostatic valves and air vents.			X			
Check gas temperature and ambient, compare with design.			X			

Switchboards	Frequency [months]					Notes
	1	3	6	12	24	
Switchboard general cleaning and corrosion points repair.				X		
Test and cleaning of all equipment and switchboard components.		X				
test and adjustment of measure equipment.		X				
Terminals tightening.	X					
Earth measurement.		X				
Thermographic verification				X		
Measuring of tension and intensity of all circuits.		X				
Electric isolation verification and supply cabling to equipment.				X		

EUROPORT – CPCC
Mechanical – Operation and Maintenance Manual

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- 1 – Equipment List
- 2 – Manufacturers List
- 3 – Equipment Manuals
- 4 – Test

EUROPORT – CPCC
Mechanical – Operation and Maintenance Manual

EQUIPMENT LIST

EUROPORT – CPCC
Mechanical – Operation and Maintenance Manual

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EQUIPMENT – MANUALS

**EUROPORT – CPCC
Mechanical – Operation and Maintenance Manual**

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- 01 - AHU 1 – Flaktgroup
- 02 - Fan Coils
- 03 - Grilles Supply
- 04 - Grilles extract
- 05 - Water Heaters
- 06 - Pump Grundfos
- 07 - Thermostatic Mixing Valve
- 08 - Smart Cool – Airedale
- 09 - Copper pipe for chilled water & Insulation
- 10 - Galvanized steel & insulation
- 11 - Rain and Foul drainage water piping (same material)
- 12 - PVC piping for condensate drainage
- 13 - Ducts and insulation
- 14 - Potable and Brackish water piping and insulation (same material)
- 15 – Split Mechanical (valve)
- 16 - Isolation Valves
- 17 – Wash basin
- 18 – Toilets & fittings

EUROPORT – CPCC
Mechanical – Operation and Maintenance Manual

SIMPLIFIED MAINTENANCE PLAN

EUROPORT – CPCC
Mechanical – Operation and Maintenance Manual

TEST

MECHANICAL EQUIPMENT SCHEDULES

Project:

Europort - CPCC Building

PROJECT NAME		AIR HANDLING UNIT																			
Europort - CPCC Building																					
Reference / Type		AHU. 1		AIR HANDLING UNIT																	
LOCATION / SYSTEM		Ground Floor CPCC (Located on Level 07 Plant Room)																			
FRESH AIR / EXHAUST DAMPERS				MAIN HEATING COIL						RETURN AIR FILTER SECTION											
Motorised / Manual		Motorised		Flow / Return Temperature (°C)				3 Stage Electric Heating Coil				Filter Type (Panel / Bag)				G4 Panel					
FROST COIL				Air On (°C)				7°C				Minimum Thermal Efficiency				-					
Flow / Return Water Temperature (°C)		n/a		Air Off (°C)				20°C				RETURN AIR FAN									
Air On (°C)		n/a		LTHW Water Flow Rate (l/s)				n/a				Design Volume (l/s)				1 643 l/s					
Air Off (°C)		n/a		Hydraulic Resistance (kPa)								External Static Pressure (Pa)				300 Pa					
LPHW Water Flow Rate (l/s)		n/a		Duty (kW)				27,0 kW				Fan Speed (rpm)				n/a					
Hydraulic Resistance (kPa)		n/a		HUMIDIFIER						For full details refer to separate humidifier schedule				Fan Type				Backward Curve			
HEAT RECOVERY SECTION				Steam Generation Rate (kg/hr)				n/a				Electrical Power Input (kW)				4 kW					
Type		Plate heat exchanger @min 65% eff.		SUPPLY AIR FAN						Running Current (Amps)				5,00 Amps							
FILTER SECTION				Design Volume (l/s)				1 622 l/s				Electrical Supply (V,Ø,HZ)				400/3/50					
Filter Type (panel / bag)		G4 Panel		External Static Pressure (Pa)				300 Pa				SOUND SPECTRUM									
Minimum Thermal Efficiency				Fan Type				Backward Curve Centrifugal				Hz	63	125	250	500	1K	2K	4K	8K	
COOLING COIL (face velocity not to exceed 2.5 m/s)				Drive Type (fixed/inverter/belt/direct drive)				Inverter				Inlet:	71	68	77	76	76	74	68	64	
Air On (°C db / °C wb)		30db 23wb		Electrical Power Input (kW)				4 kW				Outlet:	67	66	78	72	67	68	63	60	
Air Off (°C db)		20db 14bd		Running Current (Amps)				2,20 Amps				SUPPLIER DETAILS									
Flow / Return Water Temperature (°C)		7 flow, 12 return		Starting Current (Amps)				5,00 Amps				Manufacturer				Flaktgroup					
CH.W Water Flow Rate (l/s)		1,68l/s		Electrical Supply (V,Ø,HZ)				400/3/50				Controls / Accessories				Siemens Climatix 600					
Hydraulic Resistance (kPa)		30,0 kPa		SOUND SPECTRUM						Weight (kg)				1 693 kg							
Duty (kW)		50,09 (including 0,85 coil contact factor)		Hz						63	125	250	500	1K	2K	4K	8K	Internal / External		Internal	
ELIMINATOR				Inlet:										Overall Unit size (L X W X H) Height excludes concrete plinth or similar				3600x1700x1852			
Material				Outlet:										Notes							

PROJECT NAME		FAN COIL UNITS										
Europort - CPCC Building												
Ref	Location	Location	Qty	Sensible Cooling (kW)	Total Cooling (kW)	Heating	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current (A)	Manufacturer	Model	Controls
FCU01	B9.L0.01	LOBBY / SECURITY	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU05	B9.L0.02	CLINIC 1	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU45	B9.L0.03	CLINIC 2	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU06	B9.L0.04	CLINIC 3	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU46	B9.L0.05	CLINIC 4	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU04	B9.L0.06	CLINIC 5	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU03	B9.L0.07	CLINIC 6	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU49	B9.L0.08	HEAD OF STL.	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU02	B9.L0.09	CLINIC 7	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.L0.10	STAFF TOILET										
FCU10	B9.L0.11	CENTRE MANAGER	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU14	B9.L0.12	DENTAL PLANT	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU22	B9.L0.13	DENTAL CLINIC 7	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.L0.14	STORE ROOM										
FCU30	B9.L0.15	DENTAL PLANT	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU21	B9.L0.16	DENTAL CLINIC 6	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU16	B9.L0.17	STAFF ROOM / KITCHENETTE / LOCKERS	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU15	B9.L0.18	OT KITCHENETTE	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU18	B9.L0.19	SENSORY ROOM	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU19	B9.L0.20	SECRETARY OFFICE	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU50	B9.L0.21	RECORDS / ADMIN. STORE	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU20	B9.L0.22	RECEPTION / WAITING AREA 3	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME		FAN COIL UNITS										
Europort - CPCC Building												
Ref	Location	Location	Qty	Sensible Cooling (kW)	Total Cooling (kW)	Heating	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU09	B9.L0.23	GYM	1	4,80 kW	6,78 kW	Provided via heater battery	269 l/s	230, 1, 50	0,53 A	Sabiana	SKYSTAR SK-52-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.L0.24	STORE										
FCU13	B9.L0.25	PHYSIO & OT	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.L0.26	STORE										
FCU11/23	B9.L0.27	WAITING AREA / PLAY AREA	2	2,81 kW	3,88 kW	Provided via heater battery	169 l/s	230, 1, 50	0,45 A	Sabiana	SKYSTAR SK-32-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU24	B9.L0.28	DENTAL CLINIC 5	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU25	B9.L0.29	DENTAL CLINIC 4	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU08	B9.L0.30	DIABETICS + DIETETICS / GP CLINIC 03	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU42	B9.L0.31	PHLEBOTOMY & TREATMENT	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU07	B9.L0.32	OPEN PLAN OFFICE	1	4,80 kW	6,78 kW	Provided via heater battery	269 l/s	230, 1, 50	0,53 A	Sabiana	SKYSTAR SK-52-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU26	B9.L0.33	DENTAL CLINIC 3	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU17	B9.L0.34	OT BABY	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.L0.36 / 51	DIRTY UTILITY / CLEANERS										
FCU31	B9.L0.37	1:1 WORK 01	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.L0.38	STORAGE										
FCU32	B9.L0.39	1:1 WORK 02	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU33	B9.L0.40	CLINICAL NURSE	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU34	B9.L0.41	STL 2-WAY MIRROR	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU35	B9.L0.42	STL ASSESSMENT	1	2,81 kW	3,88 kW	Provided via heater battery	169 l/s	230, 1, 50	0,45 A	Sabiana	SKYSTAR SK-32-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU36	B9.L0.43	MDT ROOM	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU48	B9.L0.44	BREAST FEEDING	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU27	B9.L0.45	DENTAL CLINIC 2	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME		FAN COIL UNITS										
Europort - CPCC Building												
Ref	Location	Location	Qty	Sensible Cooling (kW)	Total Cooling (kW)	Heating	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU28	B9.I0.46	DENTAL CLINIC 1	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU29	B9.I0.47	STERIL. ROOM	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU37	B9.I0.48	CLINIC 8	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU38	B9.I0.49	CLINIC 9	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU39	B9.I0.50	CLINIC 10	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	B9.I0.52 / 53	CLEAN UTILITY / CLEAN STORE										
FCU44/44A	B9.I0.54	I.T.	2	20,00 kW	20,00 kW		2280 l/s	400, 3, 50	92,4/27,1	AIREDALE	SC09D019-X1C0-0	Individual remote temperature controllers, each unit complete with return air sensor.
	B9.I0.55	M/F DISABLED HOIST ASSIST TOILET PLUS BABY CHANGE										
	B9.I0.56	W. TOILET										
	B9.I0.57	M. TOILETS										
	B9.I0.58	BABY CHANGING ROOM										
FCU43	B9.I0.59	WAITING AREA	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU40	B9.I0.60	CLINIC 11	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU41	B9.I0.61	CLINIC 12	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU12	B9.I0.62 PCC.I2.28	X-RAY	1	1,75 kW	2,34 kW	Provided via heater battery	116 l/s	230, 1, 50	0,20 A	Sabiana	SKYSTAR SK-12-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU47	B9.I0.64	WAITING AREA 4	1	2,39 kW	3,34 kW	Provided via heater battery	138 l/s	230, 1, 50	0,32 A	Sabiana	SKYSTAR SK-22-E	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME Europort - CPCC Building	GRILLES - SUPPLY AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size mmØ or mm x mm	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Note
SG01	B9.L0.01	LOBBY / SECURITY	16	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG02	B9.L0.02	CLINIC 1	11	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG03	B9.L0.03	CLINIC 2	11	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG04	B9.L0.04	CLINIC 3	14	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG05	B9.L0.05	CLINIC 4	11	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG06	B9.L0.06	CLINIC 5	13	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG07	B9.L0.07	CLINIC 6	14	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG08	B9.L0.08	HEAD OF STL	6	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG09	B9.L0.09	CLINIC 7	13	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG10	B9.L0.10	STAFF TOILET								
SG11	B9.L0.11	CENTRE MANAGER	9	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG12	B9.L0.12	DENTAL PLANT	10	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG13	B9.L0.13	DENTAL CLINIC 7	74	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG14	B9.L0.14	STORE ROOM	23	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG15	B9.L0.15	DENTAL PLANT	9	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG16	B9.L0.16	DENTAL CLINIC 6	75	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG17	B9.L0.17	STAFF ROOM / KITCHENETTE / LOCKERS	54	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG18	B9.L0.18	OT KITCHENETTE	17	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG19	B9.L0.19	SENSORY ROOM	40	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG20	B9.L0.20	SECRETARY OFFICE	26	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG21	B9.L0.21	RECORDS / ADMIN. STORE	8	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG22	B9.L0.22	RECEPTION	42	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG23	B9.L0.23	GYM	74	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG24	B9.L0.24	STORE								
SG25	B9.L0.25	PHYSIO & OT	52	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG26	B9.L0.26	STORE	9	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG27	B9.L0.27	WAITING AREA / PLAY AREA	81	Square Diffuser	600x600	3	150 mmØ	Lindab	LCP-160-1	
SG28	B9.L0.28	DENTAL CLINIC 5	79	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG29	B9.L0.29	DENTAL CLINIC 4	74	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG30	B9.L0.30	DIABETICS + DIETETICS / GP CLINIC 03	13	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG31	B9.L0.31	PHLEBOTOMY & TREATMENT	33	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG32	B9.L0.32	OPEN PLAN OFFICE	29	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG33	B9.L0.33	DENTAL CLINIC 3	76	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG34	B9.L0.34	OT BABY	15	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG35	B9.L0.36 / 51	DIRTY UTILITY / CLEANERS								
SG36	B9.L0.37	1:1 WORK 01	6	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG37	B9.L0.38	STORAGE	4	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG38	B9.L0.39	1:1 WORK 02	6	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG39	B9.L0.40	CLINICAL NURSE	8	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG40	B9.L0.41	STL. 2-WAY MIRROR	8	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG41	B9.L0.42	STL ASSESMENT	36	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG42	B9.L0.43	MDT ROOM	13	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG43	B9.L0.44	BREAST FEEDING	11	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG44	B9.L0.45	DENTAL CLINIC 2	92	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG45	B9.L0.46	DENTAL CLINIC 1	88	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG46	B9.L0.47	STERIL. ROOM	53	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	

PROJECT NAME Europort - CPCC Building			GRILLES - SUPPLY AIR							
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Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Note
					mmØ or mm x mm					
SG47	B9.L0.48	CLINIC 8	25	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG48	B9.L0.49	CLINIC 9	28	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG49	B9.L0.50	CLINIC 10	29	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG50	B9.L0.52	CLINICAL MANAGERS OFFICE	14	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG51	B9.L0.54	I.T.								
SG52	B9.L0.55	M/F DISABLED HOIST ASSIST TOILET PLUS BABY CHANGE								
SG53	B9.L0.56	W. TOILET								
SG54	B9.L0.57	M. TOILETS								
SG55	B9.L0.58	BABY CHANGING ROOM								
SG56	B9.L0.59	WAITING AREA	23	Square Diffuser	600x600	1	125 mmØ	Lindab	LCP-125-1	
SG57	B9.L0.60	CLINIC 11	29	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG58	B9.L0.61	CLINIC 12	30	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG59	B9.L0.62 PCC.L2.28	X-RAY	9	Square Diffuser	600x600	1	150 mmØ	Lindab	LCP-160-1	
SG60	B9.L0.63	WAITING AREA 3	41	Square Diffuser	600x600	2	125 mmØ	Lindab	LCP-125-1	
SG61	B9.L0.64	WAITING AREA 4	30	Square Diffuser	600x600	2	125 mmØ	Lindab	LCP-125-1	
SG62	B9.L0.65	SWITCHBOARD								

PROJECT NAME Europort - CPCC Building			GRILLES - EXTRACT AIR					
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Ref	Location	Location	Air Volume	Type	Size		Manufacturer	Model	Note
			l/s		mmØ or mm x mm	Qty			
EG01	B9.L0.01	LOBBY / SECURITY	16	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG02	B9.L0.02	CLINIC 1	11	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG03	B9.L0.03	CLINIC 2	11	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG04	B9.L0.04	CLINIC 3	14	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG05	B9.L0.05	CLINIC 4	11	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG06	B9.L0.06	CLINIC 5	13	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG07	B9.L0.07	CLINIC 6	14	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG08	B9.L0.08	HEAD OF STL.	6	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG09	B9.L0.09	CLINIC 7	13	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
	B9.L0.10	STAFF TOILET	10						
EG11	B9.L0.11	CENTRE MANAGER	9	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG12	B9.L0.12	DENTAL PLANT	10	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG13	B9.L0.13	DENTAL CLINIC 7	74	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG14	B9.L0.14	STORE ROOM	23	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG15	B9.L0.15	DENTAL PLANT	9	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG16	B9.L0.16	DENTAL CLINIC 6	75	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG17	B9.L0.17	STAFF ROOM / KITCHENETTE / LOCKERS	54	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG18	B9.L0.18	OT KITCHENETTE	17	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG19	B9.L0.19	SENSORY ROOM	40	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG20	B9.L0.20	SECRETARY OFFICE	26	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG21	B9.L0.21	RECORDS / ADMIN. STORE	8	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG22	B9.L0.22	RECEPTION	42	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG23	B9.L0.23	GYM	74	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
	B9.L0.24	STORE							
EG25	B9.L0.25	PHYSIO & OT	52	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG26	B9.L0.26	STORE	9	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG27	B9.L0.27	WAITING AREA / PLAY AREA	81	Square Extract Grile	600x600	3	Lindab	PCY Size 600	
EG28	B9.L0.28	DENTAL CLINIC 5	79	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG29	B9.L0.29	DENTAL CLINIC 4	74	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG30	B9.L0.30	DIABETICS + DIETETICS / GP CLINIC 03	13	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG31	B9.L0.31	PHLEBOTOMY & TREATMENT	33	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG32	B9.L0.32	OPEN PLAN OFFICE	29	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG33	B9.L0.33	DENTAL CLINIC 3	76	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG34	B9.L0.34	OT BABY	15	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG35	B9.L0.36 / 51	DIRTY UTILITY / CLEANERS	21	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG36	B9.L0.37	1:1 WORK 01	6	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG37	B9.L0.38	STORAGE	4	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG38	B9.L0.39	1:1 WORK 02	6	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG39	B9.L0.40	CLINICAL NURSE	8	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG40	B9.L0.41	STL. 2-WAY MIRROR	8	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG41	B9.L0.42	STL ASSESSMENT	36	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG42	B9.L0.43	MDT ROOM	13	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG43	B9.L0.44	BREAST FEEDING	11	Square Extract Grile	600x600	1	Lindab	PCY Size 600	

PROJECT NAME Europort - CPCC Building			GRILLES - EXTRACT AIR						
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Ref	Location	Location	Air Volume	Type	Size		Manufacturer	Model	Note
			l/s		mmØ or mm x mm	Qty			
EG44	B9.L0.45	DENTAL CLINIC 2	92	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG45	B9.L0.46	DENTAL CLINIC 1	88	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG46	B9.L0.47	STERIL. ROOM	53	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG47	B9.L0.48	CLINIC 8	25	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG48	B9.L0.49	CLINIC 9	28	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG49	B9.L0.50	CLINIC 10	29	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG50	B9.L0.52	CLINICAL MANAGERS OFFICE	8	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG51	B9.L0.54	I.T.							
	B9.L0.55	M/F DISABLED HOIST ASSIST TOILET PLUS BABY CHANGE	23						
	B9.L0.56	W. TOILET	8						
	B9.L0.57	M. TOILETS	7						
	B9.L0.58	BABY CHANGING ROOM	8						
EG56	B9.L0.59	WAITING AREA	23	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG57	B9.L0.60	CLINIC 11	29	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG58	B9.L0.61	CLINIC 12	30	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG59	B9.L0.62 PCC.L2.28	X-RAY	9	Square Extract Grile	600x600	1	Lindab	PCY Size 600	
EG60	B9.L0.63	WAITING AREA 3	41	Square Extract Grile	600x600	2	Lindab	PCY Size 600	
EG61	B9.L0.64	WAITING AREA 4	30	Square Extract Grile	600x600	2	Lindab	PCY Size 600	
EG62	B9.L0.65	SWITCHBOARD							

PROJECT NAME Europort - CPCC Building			WATER HEATERS - ELECTRIC						
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Ref	Location	Location	Type	Cold Water Storage Capacity (litres)	Width (mm)	Depth (mm)	Height (mm)	Electrical Supply Details (V,Ø,HZ)	Manufacturer & Model
EWH-02	B9.L0.01	LOBBY / SECURITY	Electric Water Heater	98,00 litres	460 mm	460 mm	1 030 mm	230, 1, 50	Elvandvamer Type 644
EWH-01	B9.L0.02	CLINIC 1	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.03	CLINIC 2							
	B9.L0.04	CLINIC 3							
EWH-01	B9.L0.05	CLINIC 4	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.06	CLINIC 5							
EWH-01	B9.L0.07	CLINIC 6	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.08	HEAD OF STL.							
	B9.L0.09	CLINIC 7							
	B9.L0.10	STAFF TOILET							
	B9.L0.11	CENTRE MANAGER							
	B9.L0.12	DENTAL PLANT							
EWH-03	B9.L0.13	DENTAL CLINIC 7	Electric Water Heater	30,00 litres	380 mm	540 mm	380 mm	230, 1, 51	Elvandvamer Type 908
	B9.L0.14	STORE ROOM							
	B9.L0.15	DENTAL PLANT							
	B9.L0.16	DENTAL CLINIC 6							
EWH-01	B9.L0.17	STAFF ROOM / KITCHENETTE / LOCKERS	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.18	OT KITCHENETTE							
EWH-01	B9.L0.19	SENSORY ROOM	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.20	SECRETARY OFFICE							
	B9.L0.21	RECORDS / ADMIN. STORE							
	B9.L0.22	RECEPTION							
EWH-01	B9.L0.23	GYM	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.24	STORE							
	B9.L0.25	PHYSIO & OT							
	B9.L0.26	STORE							
	B9.L0.27	WAITING AREA / PLAY AREA							
EWH-03	B9.L0.28	DENTAL CLINIC 5	Electric Water Heater	30,00 litres	380 mm	540 mm	380 mm	230, 1, 51	Elvandvamer Type 908
	B9.L0.29	DENTAL CLINIC 4							
	B9.L0.30	DIABETICS + DIETETICS / GP CLINIC 03							
	B9.L0.31	PHLEBOTOMY & TREATMENT							
	B9.L0.32	OPEN PLAN OFFICE							
	B9.L0.33	DENTAL CLINIC 3							
	B9.L0.34	OT BABY							
EWH-01	B9.L0.36 / 51	DIRTY UTILITY / CLEANERS	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.37	1:1 WORK 01							
	B9.L0.38	STORAGE							
	B9.L0.39	1:1 WORK 02							
	B9.L0.40	CLINICAL NURSE							
	B9.L0.41	STL. 2-WAY MIRROR							
	B9.L0.42	STL ASSESMENT							
	B9.L0.43	MDT ROOM							
	B9.L0.44	BREAST FEEDING							
EWH-03	B9.L0.45	DENTAL CLINIC 2	Electric Water Heater	30,00 litres	380 mm	540 mm	380 mm	230, 1, 51	Elvandvamer Type 908

PROJECT NAME Europort - CPCC Building		WATER HEATERS - ELECTRIC	
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Ref	Location	Location	Type	Cold Water Storage Capacity (litres)	Width (mm)	Depth (mm)	Height (mm)	Electrical Supply Details (V,Ø,HZ)	Manufacturer & Model
	B9.L0.46	DENTAL CLINIC 1							
EWH-01	B9.L0.47	STERIL. ROOM	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.48	CLINIC 8							
EWH-01	B9.L0.49	CLINIC 9	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.50	CLINIC 10							
	B9.L0.52	CLINICAL MANAGERS OFFICE							
	B9.L0.54	I.T.							
	B9.L0.55	M/F DISABLED HOIST ASSIST TOILET PLUS BABY CHANGE							
	B9.L0.56	W. TOILET							
EWH-02	B9.L0.57	M. TOILETS	Electric Water Heater	98,00 litres	460 mm	460 mm	1 030 mm	230, 1, 50	Elvandvamer Type 644
	B9.L0.58	BABY CHANGING ROOM							
	B9.L0.59	WAITING AREA							
	B9.L0.60	CLINIC 11							
EWH-01	B9.L0.61	CLINIC 12	Electric Water Heater	30,00 litres	460 mm	345 mm	525 mm	230, 1, 50	Elvandvamer Type 907
	B9.L0.62 PCC.L2.28	X-RAY							
	B9.L0.63	WAITING AREA 3							
	B9.L0.64	WAITING AREA 4							
	B9.L0.65	SWITCHBOARD							

PROJECT NAME

Drainage Pump Grundfos



Europort - CPCC Building

Ref	Location	Location	Type	Electrical Supply Details (V,Ø,HZ)	Manufacturer & Model
	B9.L0.01	LOBBY / SECURITY			
DP01	B9.L0.02	CLINIC 1	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.03	CLINIC 2	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.04	CLINIC 3	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.05	CLINIC 4			
DP01	B9.L0.06	CLINIC 5	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.07	CLINIC 6	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.08	HEAD OF STL.			
DP01	B9.L0.09	CLINIC 7	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.10	STAFF TOILET			
	B9.L0.11	CENTRE MANAGER			
	B9.L0.12	DENTAL PLANT			
DP01	B9.L0.13	DENTAL CLINIC 7	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.14	STORE ROOM			
	B9.L0.15	DENTAL PLANT			
DP01	B9.L0.16	DENTAL CLINIC 6	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.17	STAFF ROOM / KITCHENETTE / LOCKERS	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.18	OT KITCHENETTE			
	B9.L0.19	SENSORY ROOM			
	B9.L0.20	SECRETARY OFFICE			
	B9.L0.21	RECORDS / ADMIN. STORE			
	B9.L0.22	RECEPTION			
DP01	B9.L0.23	GYM	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.24	STORE			
DP01	B9.L0.25	PHYSIO & OT	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.26	STORE			
	B9.L0.27	WAITING AREA / PLAY AREA			
DP01	B9.L0.28	DENTAL CLINIC 5	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.29	DENTAL CLINIC 4			
DP01	B9.L0.30	DIABETICS + DIETETICS / GP CLINIC 03	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.31	PHLEBOTOMY & TREATMENT	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2

PROJECT NAME

Drainage Pump Grundfos



Europort - CPCC Building

Ref	Location	Location	Type	Electrical Supply Details (V,Ø,HZ)	Manufacturer & Model
	B9.L0.32	OPEN PLAN OFFICE			
DP01	B9.L0.33	DENTAL CLINIC 3	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.34	OT BABY			
	B9.L0.36 / 51	DIRTY UTILITY / CLEANERS			
	B9.L0.37	1:1 WORK 01			
	B9.L0.38	STORAGE			
	B9.L0.39	1:1 WORK 02			
	B9.L0.40	CLINICAL NURSE			
	B9.L0.41	STL. 2-WAY MIRROR			
	B9.L0.42	STL ASSESSMENT			
	B9.L0.43	MDT ROOM			
	B9.L0.44	BREAST FEEDING			
DP01	B9.L0.45	DENTAL CLINIC 2	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.46	DENTAL CLINIC 1	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.47	STERIL. ROOM	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.48	CLINIC 8	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	B9.L0.49	CLINIC 9	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.50	CLINIC 10			
	B9.L0.52	CLINICAL MANAGERS OFFICE			
	B9.L0.54	I.T.			
	B9.L0.55	M/F DISABLED HOIST ASSIST TOILET PLUS BABY CHANGE			
	B9.L0.56	W. TOILET			
	B9.L0.57	M. TOILETS			
	B9.L0.58	BABY CHANGING ROOM			
	B9.L0.59	WAITING AREA			
	B9.L0.60	CLINIC 11			
DP01	B9.L0.61	CLINIC 12	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	B9.L0.62 PCC.L2.28	X-RAY			
	B9.L0.63	WAITING AREA 3			
	B9.L0.64	WAITING AREA 4			
	B9.L0.65	SWITCHBOARD			

Filters	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual		X				

Ducts diffusers elements and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Ducts						
Corrosion verification and insulation application.				X		
Internal inspection and cleaning.				X		
Flows check and compare with design.				X		
Fire dampers						
Working test.				X		
Check that damper stays open after inspection.				X		
Diffusion, return and air extraction air elements						
Surface cleaning with soft humid cloth				X		
Check airflows and compare with design.				X		

Hydraulic networks components and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Piping						
Brine leakage verification.	X					
Verification of corrosion, insulation, painting, supports and expansion joints.			X			
Air vents verification and filling of all branches.	X					
Valves						
Corrosion verification, joints and open and closure test.		X				
Elastic coupling						
Deformation inspection and brine leakages.	X					
Vessels						
Corrosion verification, insulation and inner cleaning.				X		
All valves working inspection.				X		
Calibrate manometers and thermometers.				X		
Closed expansion vessels						
Corrosion verification and inspect membrane.				X		
Leakages check, air pressure in chamber and safety valve.	X					
Compressor working verification.				X		
pressure switches and solenoid valves check.			X			
Water filters						
Brine leakages check and clean filter.					X	
Water flow meters						
Corrosion and brine leakage check. Metering register.	X					
Check working and measurement.					X	
Flow switches						
Corrosion check and brine leakage.	X					
Inner pipe cleaning.				X		
Electric contact tightening.				X		

Heat Exchangers	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Plate and dry coolers heat exchangers	X					
Check corrosion points, deformation, water leaks and cleaning.	X					
Thermal insulation state check.				X		
Opening, plate cleaning, substitution of damage plates and joints.				X		
Check tightness verification between primary and secondary circuit.		X				

Batteries	Frequency [months]					Notes
	1	3	6	12	24	
Corrosion and oxidation inspection, cleaning and painting.				X		
Internal module cleaning and leakages check				X		
Air vents cleaning check.		X				
Check state and working of automatic valves and filters.			X			
Check anti ice system				X		
Cleaning and working check of condensate pans and siphons.			X			
Electric batteries working check, cabling and mechanical latching.	X					

Fan coils (internal units)	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Water and gas leaks check.	X					
Control systems check, thermostatic valves and air vents.			X			
Check gas temperature and ambient, compare with design.			X			

Smart Cool - AIREDALE	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Water and gas leaks check.	X					
Control systems check, thermostatic valves and air vents.			X			
Check gas temperature and ambient, compare with design.			X			

Switchboards	Frequency [months]					Notes
	1	3	6	12	24	
Switchboard general cleaning and corrosion points repair.				X		
Test and cleaning of all equipment and switchboard components.		X				
test and adjustment of measure equipment.		X				
Terminals tightening.	X					
Earth measurement.		X				
Thermographic verification				X		
Measuring of tension and intensity of all circuits.		X				
Electric isolation verification and supply cabling to equipment.				X		

AHU-1	Periodicidade [Meses]					Observações
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Free cooling module						
Check the operation of registers and servomotors			X			
Checking circuits and electrical equipment, terminal tightening			X			
Measurement of airflows and comparison with design values			X			
Filter module						
Check routines indicated on specific O&M manual						
Power recovery module						
Check routines listed in Heat Exchangers						
Air Treatment Batteries Module						
Check routines listed in Batteries						
Ventilation module						
Check for noise, vibration and direction of rotation		X				
Check motors for operation		X				
Check the of control, command and safety equipment		X				
Checking electrical insulation, tightening terminals				X		
Measurement of operating voltages and currents	X					
Recording operating data and compare with project			X			
Determine yields of the various sections and compare with project			X			

BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : PUBLIC HEALTH

INSTALLATION TYPE : COLD WATER | HOT WATER |

PIPE TYPE : UPONOR MULTILAYER PIPE 16mm, 20mm e 25mm

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10

[bar]

Duration Test:

1 hr

Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
14/05/2019 11:00:00	10 bar	14/05/2019 12:00:00	10 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

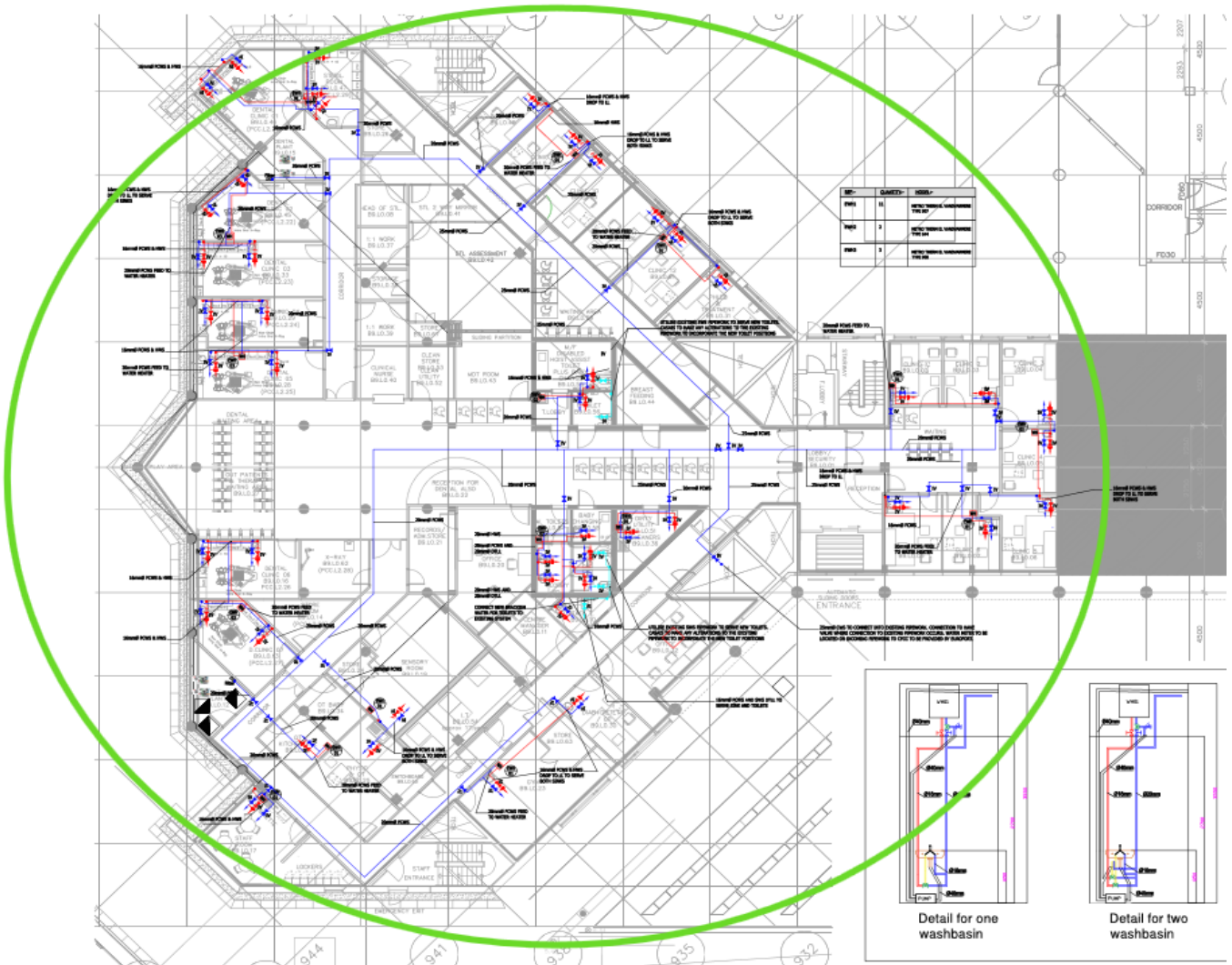
Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____



BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : MECHANICAL

INSTALLATION TYPE : Condensate Drainage

PIPE TYPE : Press PVC

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid: WATER

Test Pressure: 6,00 [bar]

Duration Test: 15 MIN

Max Error Margin: 1% [%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
19/03/2019 - 16:15:00	6,00	19/03/2019 - 16:30:00	6,00		

NOTES



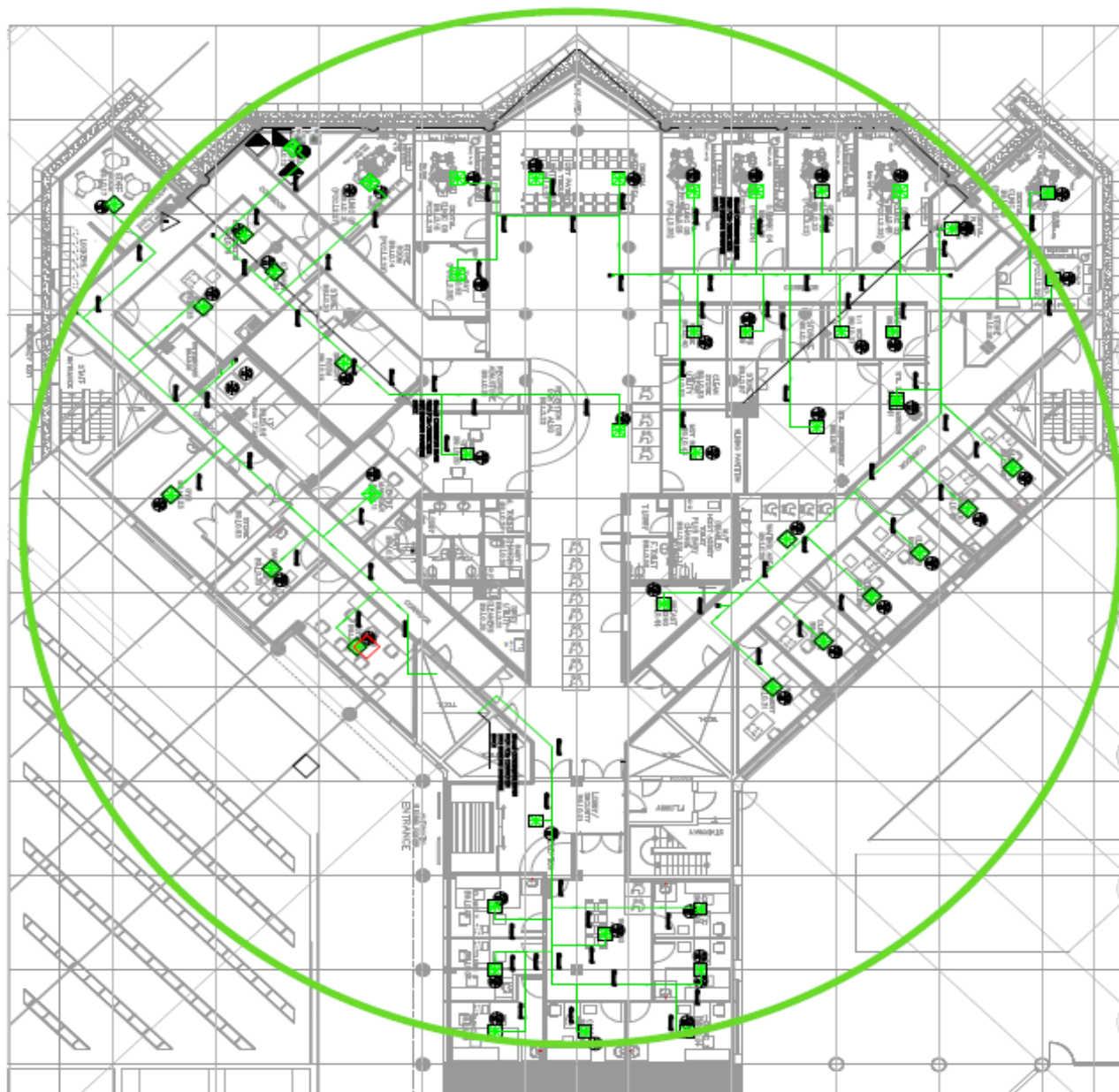
VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____ Date: _____

CLIENT BEHALF : _____ Date: _____

CLIENT BEHALF : _____ Date: _____



BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : PUBLIC HEALTH

INSTALLATION TYPE : DRAINAGE WATER - RISERS / RAINWATER

PIPE TYPE : PVC-U

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

10

[cmH2O]

Duration Test:

15

Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
21/03/2019 9:00:00	10cmH2O	21/03/2019 9:15:00	10cmH2O		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

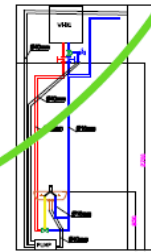
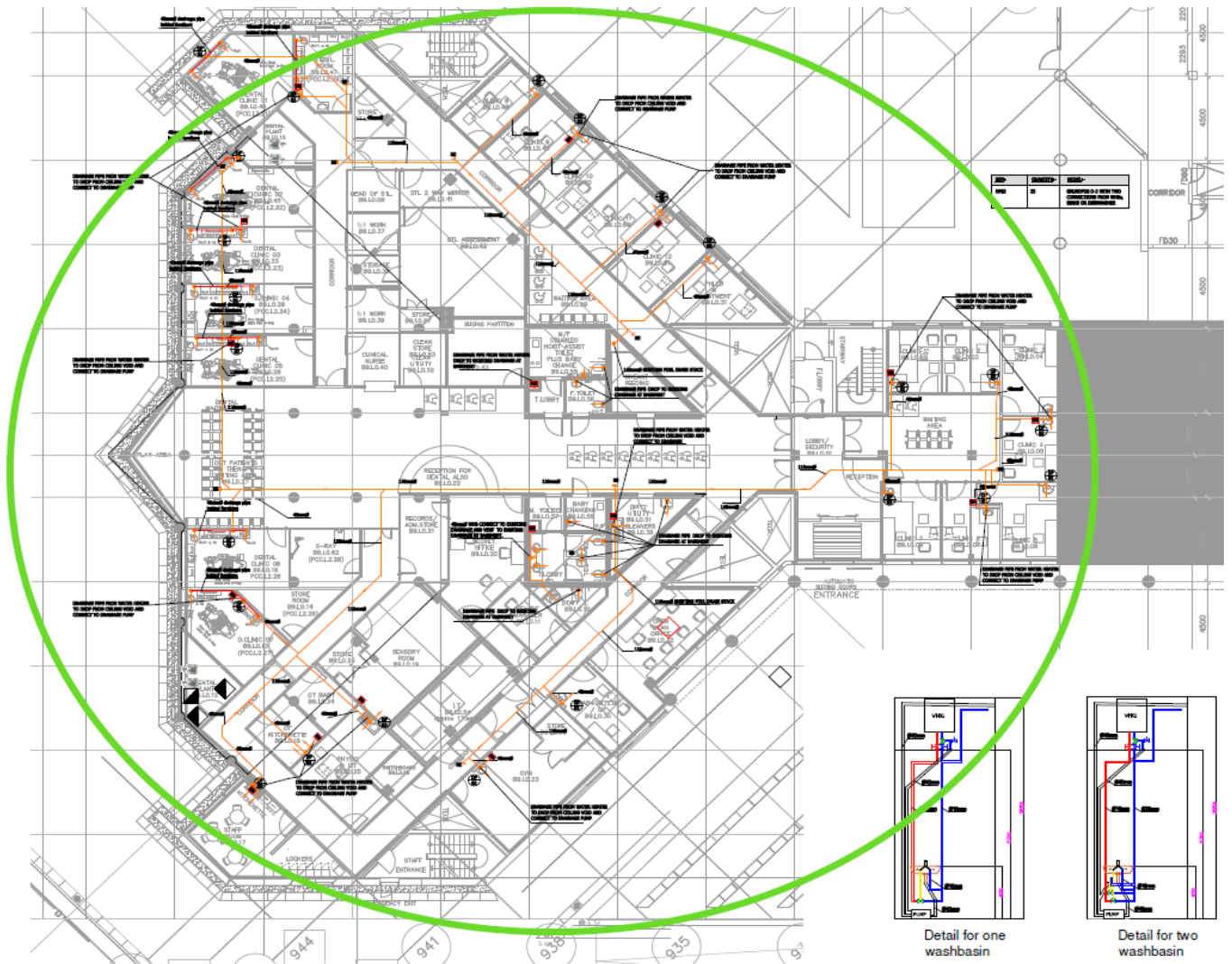
Date: _____

CLIENT BEHALF : _____

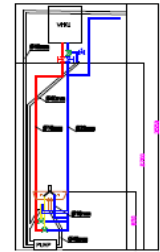
Date: _____

CLIENT BEHALF : _____

Date: _____



Detail for one washbasin



Detail for two washbasin

BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : MECHANICAL

INSTALLATION TYPE : HVAC Galvanized steel

PIPE TYPE : Galvanized steel

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10,00

[bar]

Duration Test:

48HORAS

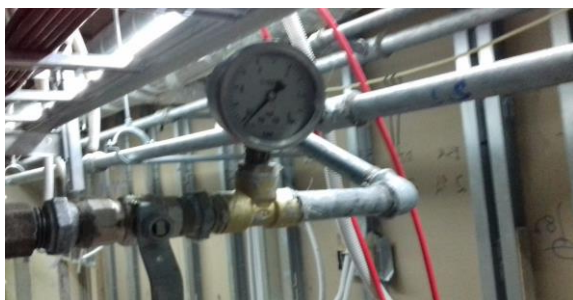
Max Error Margin

1%

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
17/01/2019 - 11:00	10,00 bar	19/01/2019 -12:00	10,00 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____



BUILDING INFORMATION

NAME: **EUROPORT**

REF: **CPCC**

CLIENT:

INSTALLATION INFORMATION

TRADE : **MECHANICAL**

INSTALLATION TYPE : **HVAC Galvanized steel**

PIPE TYPE : **Galvanized steel**

LEVEL/RISING:

LOCATION :

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10,00

[bar]

Duration Test:

48HORAS

Max Error Margin

1%

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
17/01/2019 - 11:00	10,00 bar	19/01/2019 -12:00	10,00 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date:

CLIENT BEHALF :

Date:

CLIENT BEHALF :

Date:



BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : MECHANICAL

INSTALLATION TYPE : HVAC Galvanized steel

PIPE TYPE : Galvanized steel

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10,00

[bar]

Duration Test:

48HORAS

Max Error Margin

1%

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
04/03/2019 - 15:00	10,00 bar	6/03/2019 - 16:00	10,00 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____



BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : MECHANICAL

INSTALLATION TYPE : Ventilation Systems

PIPE TYPE : Circular Spiral Ducts

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

400

[Pa]

Duration Test:

5min

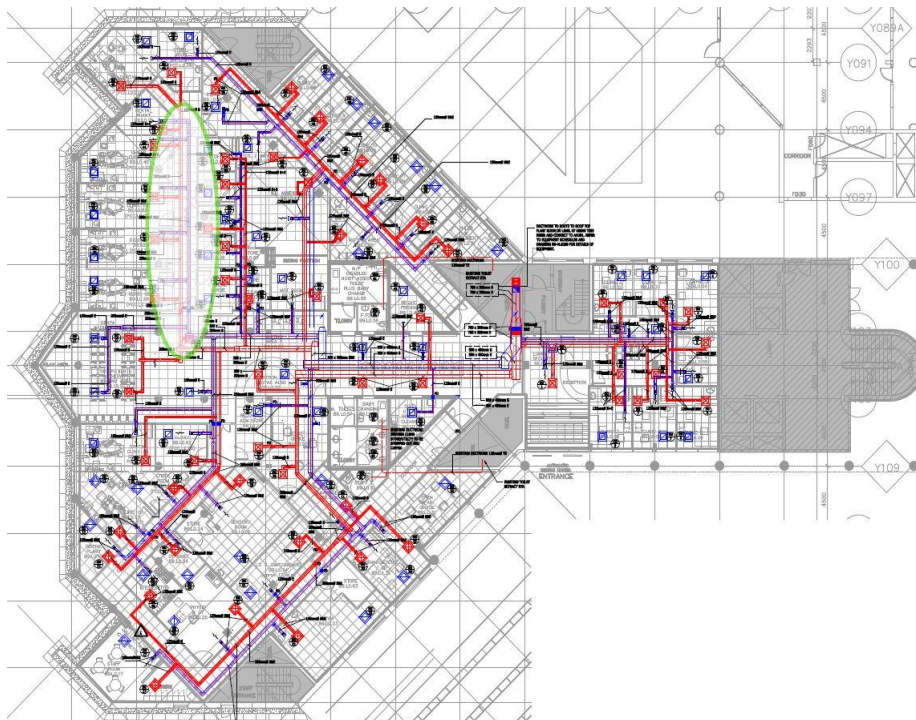
Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

EUROPORT



www.casais.gi

P.O. Box 1485 | 3rd floor, 5, Secretary's Lane | Gibraltar
T – (+350) 20045242 F – (+350) 20044478

Leakage test

Project

Customer name	CPCC	Wöhler DP 700 1.04
Customer number	1	Serial No. 1199
Duct	EXTRACT DUCT	Calibration date 19/10/2018

Leakage test report of air ducts in accordance to
EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date	15/11/2018
Measuring time	15:21

Presettings

Surface area	15 m ²
Tightness class	D
Rate factor	1 l/(s m ²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	401 Pa
Leakage rate	0.1389 l/s
Duration	00:05:00 min

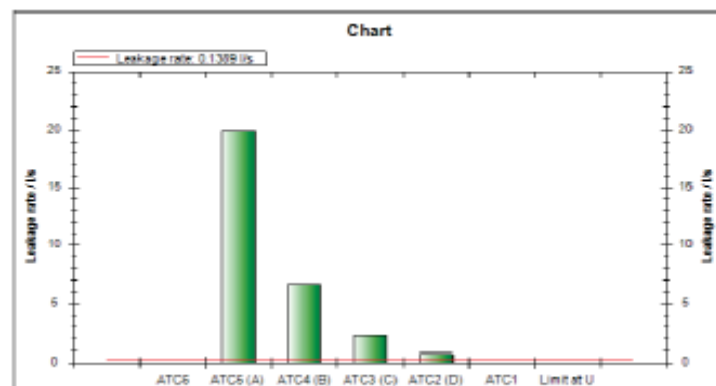
Result

Test passed.

Remarks

Limits

ATC6	
ATC5 (A)	19.939 l/s
ATC4 (B)	6.6464 l/s
ATC3 (C)	2.2155 l/s
ATC2 (D)	0.7385 l/s
ATC1	
Limit at U	



Date

Signature

BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : MECHANICAL

INSTALLATION TYPE : Ventilation Systems

PIPE TYPE : Circular Spiral Ducts

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

400

[Pa]

Duration Test:

5min

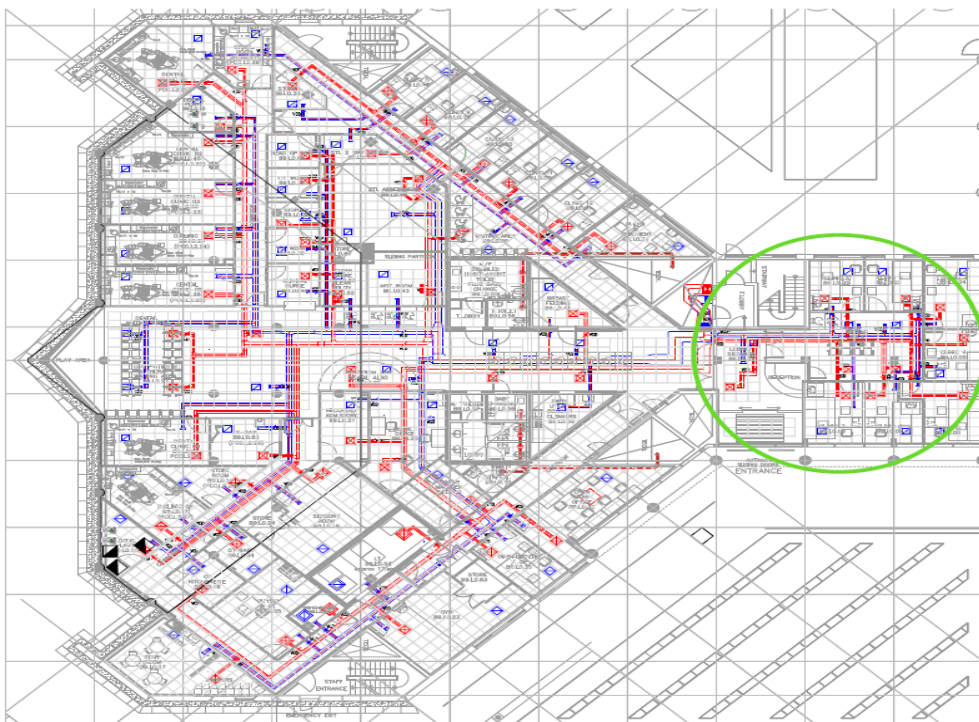
Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date:

CLIENT BEHALF :

Date:

CLIENT BEHALF :

Date:



www.casais.gi

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T – (+350) 20045242 F – (+350) 20044478

Leakage test

Project

Customer name	CPCC	Wöhler DP 700 1.04
Customer number	1	Serial No. 1199
Duct	Insulation	Calibration date 19/10/2018

Leakage test report of air ducts in accordance to
EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date	28/11/2018
Measuring time	11:48

Presettings

Surface area	25 m ²
Tightness class	D
Rate factor	1 l/(s m ²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	400 Pa
Leakage rate	0.1007 l/s
Duration	00:05:00 min

Limits

ATC6	
ATC5 (A)	33.178 l/s
ATC4 (B)	11.059 l/s
ATC3 (C)	3.6865 l/s
ATC2 (D)	1.2288 l/s
ATC1	
Limit at U	0.0246 l/s

Result

Test passed.

Remarks

Date

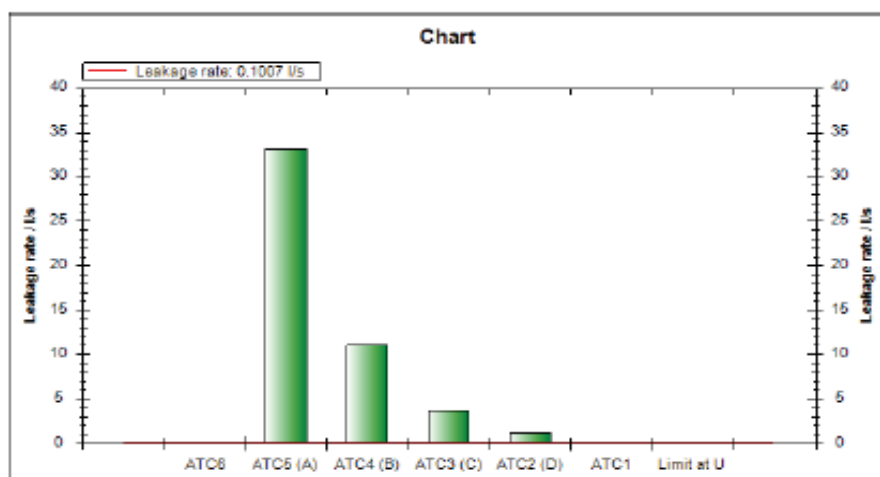
Signature

Diagram for Leakage test

Project

Customer name	CPCC	Wöhler DP 700 1.04
Customer number	1	Serial No. 1199
Duct	Insufflation	Calibration date 19/10/2018

Measuring date	28/11/2018
Measuring time	11:48



BUILDING INFORMATION

NAME: EUROPORT

REF: CPCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : MECHANICAL

INSTALLATION TYPE : Ventilation Systems

PIPE TYPE : Circular Spiral Ducts

LEVEL/RISING: _____

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

400

[Pa]

Duration Test:

5min

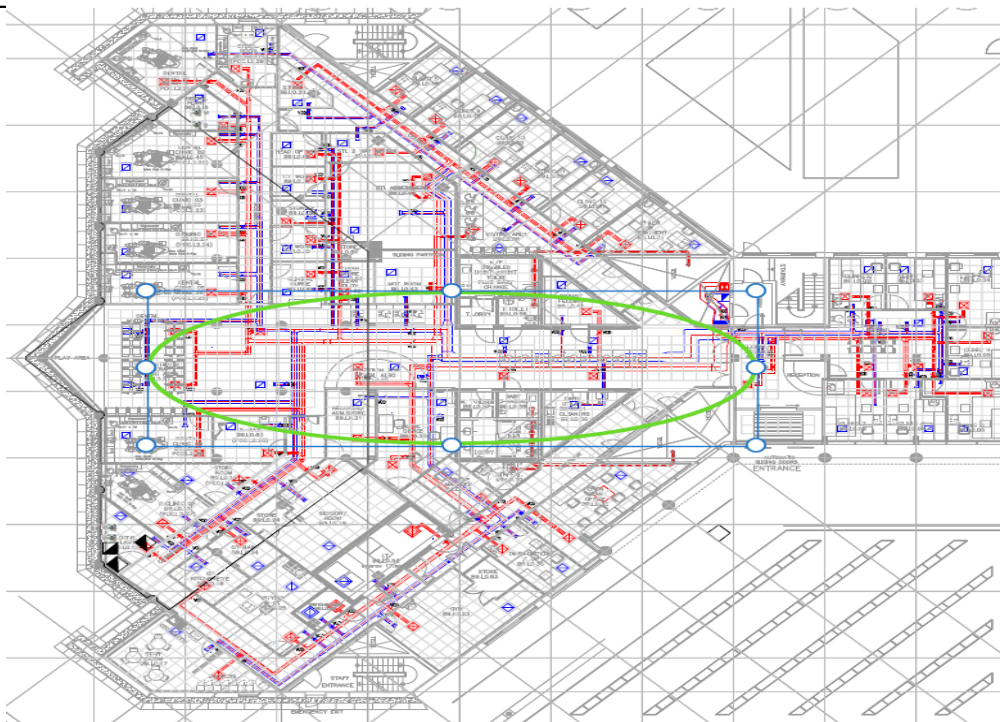
Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date:

CLIENT BEHALF :

Date:

CLIENT BEHALF :

Date:

Leakage test

Project

Customer name	CPCC	Wöhler DP 700 1.04
Customer number	1	Serial No. 1199
Duct	Extract	Calibration date 19/10/2018

Leakage test report of air ducts in accordance to EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date	28/11/2018
Measuring time	12:06

Presettings

Surface area	18 m ²
Tightness class	D
Rate factor	1 l/(s m ²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	400 Pa
Leakage rate	0.1005 l/s
Duration	00:05:00 min

Limits

ATC6	
ATC5 (A)	23.892 l/s
ATC4 (B)	7.9841 l/s
ATC3 (C)	2.6547 l/s
ATC2 (D)	0.8849 l/s
ATC1	
Limit at U	0.0177 l/s

Result

Test passed.

Remarks

Date _____

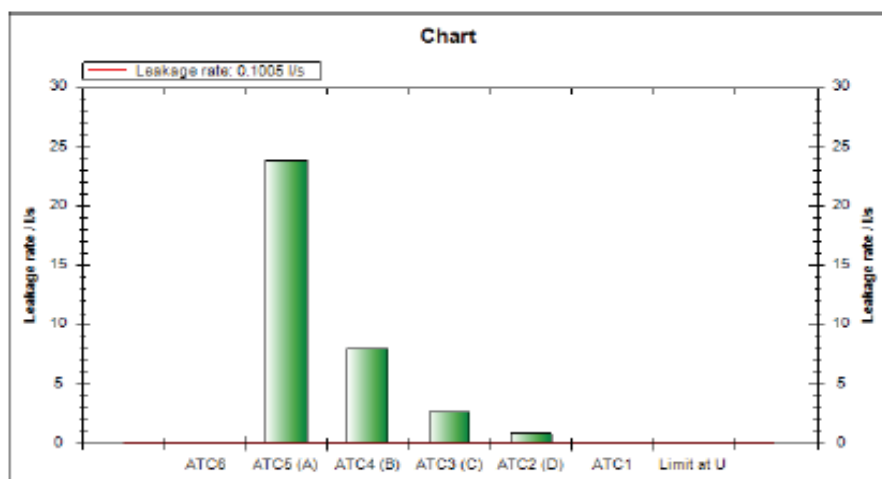
Signature _____

Diagram for Leakage test

Project

Customer name	CPCC	Wöhler DP 700 1.04
Customer number	1	Serial No. 1199
Duct	Extract	Calibration date 19/10/2018

Measuring date	28/11/2018
Measuring time	12:06



EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

GENERAL INDEX

- 1 – Equipment List
- 2 – Manufacturers List
- 3 – Equipment Manuals
- 4 – Test



EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

EQUIPMENT LIST



EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

MANUFACTURERS LIST

EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

EQUIPMENT – MANUALS

EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

EQUIPMENT LIST MANUALS INDEX

- 01 - AHU 1 – Flaktgroup
- 02 - Fan Coils
- 03 - Grilles Supply
- 04 - Grilles extract
- 05 - Fan – Extract
- 06 - Pump Grundfos
- 07 - Thermostatic Mixing Valve
- 08 - In Rak 300mm - Server Room
- 09 - Copper pipe for chilled water & Insulation
- 10 - Galvanized steel & insulation
- 11 - Rain and Foul drainage water piping (same material)
- 12 - PVC piping for condensate drainage
- 13 - Ducts and insulation
- 14 - Potable water piping and insulation
- 15 – Split Mechanical (valve)
- 16 - Isolation Valves
- 17 – Wash basin
- 18 – Toilets & fittings
- 19 - Daikin - Server Room
- 20 - Pumps Armstrong
- 21 - Salt water supply piping
- 22 - Dry Riser

EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

SIMPLIFIED MAINTENANCE PLAN

EUROPORT – PCC
Mechanical – Operation and Maintenance Manual

TEST

MECHANICAL EQUIPMENT SCHEDULES

Project: **Europort - PCC Building**

PROJECT NAME

Europort - PCC Building

AIR HANDLING UNIT



Reference / Type	AHU 2	AIR HANDLING UNIT															
LOCATION / SYSTEM	Plant Room 4																
FRESH AIR / EXHAUST DAMPERS		MAIN HEATING COIL							RETURN AIR FILTER SECTION								
Motorised / Manual	Motorized	Flow / Return Temperature (°C)				85/70			Filter Type (Panel / Bag)					G4 Panel			
FROST COIL		Air On (°C)				8°C			Minimum Thermal Efficiency					-			
Flow / Return Water Temperature (°C)	n/a	Air Off (°C)				21°C			RETURN AIR FAN								
Air On (°C)	n/a	LTHW Water Flow Rate (l/s)				0,64 l/s			Design Volume (l/s)					2 320 l/s			
Air Off (°C)	n/a	Hydraulic Resistance (kPa)				13,4 kPa			External Static Pressure (Pa)					250 Pa			
LPHW Water Flow Rate (l/s)	n/a	Duty (kW)				26,7 kW			Fan Speed (rpm)								
Hydraulic Resistance (kPa)	n/a	HUMIDIFIER							Fan Type								
HEAT RECOVERY SECTION		Steam Generation Rate (kg/hr)				n/a			Electrical Power Input (kW)					11 kW			
Type	two water coils where there speed pump	SUPPLY AIR FAN							Running Current (Amps)					18,20 Amps			
FILTER SECTION		Design Volume (l/s)				2 018 l/s			Electrical Supply (V,Ø,HZ)					400/3/50			
Filter Type (panel / bag)	G4 Panel	External Static Pressure (Pa)				250 Pa			SOUND SPECTRUM								
Minimum Thermal Efficiency		Fan Type				EC Fan			Hz	63	125	250	500	1K	2K	4K	8K
COOLING COIL (face velocity not to exceed 2.5 m/s)		Drive Type (fixed/inverter/belt/direct drive)				Inverter			Inlet:	71	68	77	76	76	74	68	64
Air On (°C db / °C wb)	30db	Electrical Power Input (kW)				11 kW			Outlet:	67	66	78	72	67	68	63	60
Air Off (°C db)	20db	Running Current (Amps)				18,20 Amps			SUPPLIER DETAILS								
Flow / Return Water Temperature (°C)	7 flow, 12 return	Starting Current (Amps)				18,20 Amps			Manufacturer					Flaktgroup			
Hydraulic Resistance (kPa)	38,4 kPa	SOUND SPECTRUM							Weight (kg)								
Duty (kW)	88,0kW	Hz	63	125	250	500	1K	2K	4K	8K	Internal / External					Internal	
ELIMINATOR		Inlet:							Overall Unit size (L X W X H) Height excludes concrete plinth or similar								
Material		Outlet:							Notes								

PROJECT NAME Europort - PCC Building	FANS - EXTRACT	
--	-----------------------	---

Reference	TEF.01	
Location	Plant Room 04	
System	Toilet Extract	
Air Volume Flow Rate (l/s)	177 l/s	
SFP (W/l/s)	0,50	
Static Pressure (Pa)	101 Pa	
Fan Type	Twin Extract Fan	
Fan Speed (rpm)	2 500 rpm	
Weight (kg)		
Unit Size (mm l x mm w x mm h)	1831 x 789 x 334	
Sound Power Spectrum dB (HZ 63 to 8K)		
Electrical Power Input (kW)	0,50 kW	
Running Current (Amps)	1,35 Amps	
Starting Current (Amps)	1,35 Amps	
Electrical Supply (V,Ø,HZ)	230, 1, 50	
Type of Starter	Timeclock	
Supplier Details		
Manufacturer	Nuair	
Model Reference	AVT3	
Acoustic Treatment	Yes	
Controls / Accessories	Ecosmart Controller W/ Timeclock, Flexible connection.	
Notes	2 x CFC25 2 x AVT3-MSS 3 x NAV2 Flexible connector Matched Silencer - Standard Anti - vibration mounting kit	

PROJECT NAME Europort - PCC Building	Pumps Armstrong	
--	------------------------	---

Reference	P.01
Location	Plant Room
System	Chilled Water System Serving PCC and Block 4
Design Duty (m3/hr)	43,2 m3/hr
Design Pressure (kPa)	
Pump Efficiency (%)	
Pump Type	Horizontal close coupled end suction pump
Operatint Temperature (°C)	15,55°C
Maximum Static Pressure (BarG)	16 bar
Construction	Cast Iron (BS 1452 Grade 260)
Connection (in)	Inlet 4 in ; Outlet: 3 in
Pump Speed (rpm)	1470,00 kW
Electrical Details	
Electrical Power Input (kW)	2,20 kW
Running Current (Amps)	4,62 A
Starting Current (Amps)	4,62 A
Electrical Supply (V,Ø, Hz)	400/3/50
Supplier Details	
Manufacturer	Armstrong
Model Reference	Series 4280-80-200-2,2 kW
Controls	VLT AQUA Drive FC 202, 3,0 kW - Danfoss -
Accessories / Notes	Connections to incorporate flexible neoprene bellows

PROJECT NAME Europort - PCC Building	FAN COIL UNITS	
--	-----------------------	---

Ref	Location	Location	Qty	Cooling (kW)	Heating (kW)	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU0.25	PCC.LO.01	Nurse Base	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	PCC.LO.02	Store									
FCU0.01	PCC.LO.04	Dist. Nurse	1	2,71 kW	3,31 kW	158 l/s	230, 1, 50	0,50 A	TROX	PWX-90/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.03	PCC.LO.05	Sister's Office	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.04	PCC.LO.06	Nurse Practitioner	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.05	PCC.LO.07	GP Clinic	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.06	PCC.LO.08	GP Clinic 2	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.07	PCC.LO.09	GP Clinic 3	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.08	PCC.LO.10	GP Clinic 4	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.09	PCC.LO.11	GP Clinic 5	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.10	PCC.LO.12	GP Clinic 6	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.11	PCC.LO.13	GP Clinic 7	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.12	PCC.LO.14	GP Clinic 8	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.13	PCC.LO.15	GP Clinic 9	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.14	PCC.LO.16	GP Clinic 10	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.15	PCC.LO.17	GP Clinic 11	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.16	PCC.LO.18	GP Clinic 12	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.17	PCC.LO.19	GP Clinic 13	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.18	PCC.LO.20	GP Clinic 14	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.19	PCC.LO.21	GP Clinic 15	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.20	PCC.LO.22	Nurse Practitioners Clinics	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME	FAN COIL UNITS	
Europort - PCC Building		

Ref	Location	Location	Qty	Cooling (kW)	Heating (kW)	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU0.21	PCC.I.O.23	Diabetic & Dietetics Clinics	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.22	PCC.I.O.24	Diabetic & Dietetics Clinics	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	PCC.I.O.25	Store									
	PCC.I.O.28	Waiting area									
FCU0.23	PCC.I.O.29	Call Center	1	2,10 kW	2,2 kW	131 l/s		0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.02	PCC.I.O.30	Observation Area	1	2,71 kW	3,31 kW	158 l/s	230, 1, 50	0,50 A	TROX	PWX-90/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.26	PCC.I.O.31	SEE & Treat Area	2	2,10 kW	2,2 kW	131 l/s		0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	PCC.I.O.32	Asssit. Shower & WC									
	PCC.I.O.33	Dirty Util.									
	PCC.I.O.34	Clean Util.									
FCU0.29	PCC.I.O.37	Beverage	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU0.28	PCC.I.O.36	I.T.Room	2	22,10 kW		1100 l/s	230, 1, 50	7,50 A	Airedale	LIR3042U-C025-7	
DX.01 /DX.02	PCC.I.O.36	I.T.Room	2	12,00 kW	13,5 kW	320 l/s	380, 3, 52	16,00 A	Daikin	FCAG125A+RZQSG125L8Y1	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME Europort - PCC Building	FAN COIL UNITS	
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Ref	Location	Location	Qty	Cooling (kW)	Heating (kW)	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU1.01	PCC.L1.01	Hyper T	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.02	PCC.L1.02	Nurse Practitioner	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.03	PCC.L1.03	GP Clinic 16	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.04	PCC.L1.04	Kitchen / Staff	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.05	PCC.L1.05	GP Clinic 17	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.06	PCC.L1.06	GP Clinic 18	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.07	PCC.L1.07	GP Clinic 19	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.08	PCC.L1.08	GP Clinic 20	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.09	PCC.L1.09	GP Clinic 21	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.10	PCC.L1.10	GP Clinic 22	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.11	PCC.L1.11	Dermatology Minor Op Clinic	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.12	PCC.L1.12	PUVA	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.13	PCC.L1.13	Derma 1	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.14	PCC.L1.14	Derma 2	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.15	PCC.L1.15	GP Clinic 24	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.16	PCC.L1.16	GP Clinic 25	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.17	PCC.L1.17	GP Clinic 26	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.18	PCC.L1.18	GP Clinic 27	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.19	PCC.L1.19	GP Clinic 28	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.20	PCC.L1.20	GP Clinic 29	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU1.21	PCC.L1.21	Medical Secretaries	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME Europort - PCC Building	FAN COIL UNITS	
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Ref	Location	Location	Qty	Cooling (kW)	Heating (kW)	Air Flow Rate (l/s)	Electrical Supply (V, Ø, HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU2.01	PCC.I2.01	Councillor's Clinic 1	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.02	PCC.I2.02	Councillor's Clinic 2	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.03	PCC.I2.03	Councillor's Clinic 3	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.04	PCC.I2.04	Well Man / Well Woman 1	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.05	PCC.I2.05	Well Man / Well Woman 2	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.06	PCC.I2.06	Well Man / Well Woman 3	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.07	PCC.I2.07	Community Midwife	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.08	PCC.I2.08	Dr. Vassallo Clinic	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.09	PCC.I2.09	Dietician	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.10	PCC.I2.10	Board Room	1	3,47 kW	4,0 kW	211 l/s	230, 1, 50	0,50 A	TROX	PWX-90/2-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.11	PCC.I2.11	Beverage	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	PCC.I2.12	Dis. Toilet 1									
	PCC.I2.13	Toilet 2									
FCU2.22	PCC.I2.14	Waiting Area	2	2,71 kW	3,31 kW	158 l/s	230, 1, 50	0,50 A	TROX	PWX-90/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.23	PCC.I2.15	Admin	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	PCC.I2.16	Dirty Util.									
	PCC.I2.17	Clean Store									
FCU2.24	PCC.I2.18	Finance Admin.	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.20	PCC.I2.19	Mental Health Waiting Area	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
	PCC.I2.20	Store									
FCU2.19	PCC.I2.21	Mental Health Clinic 1	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME	FAN COIL UNITS	
Europort - PCC Building		

Ref	Location	Location	Qty	Cooling (kW)	Heating (kW)	Air Flow Rate (l/s)	Electrical Supply (V,Ø,HZ)	Running Current(A)	Manufacturer	Model	Controls
FCU2.18	PCC.I2.22	Mental Health Clinic 2	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.17	PCC.I2.23	Mental Health Clinic 3	1	2,10 kW	2,2 kW	131 l/s	230, 1, 51	1,40 A	TROX	PWX-60/1-F8	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.16	PCC.I2.24	Councillor's	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.15	PCC.I2.25	Clinical Nurse Manager	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.14	PCC.I2.26	PCC director	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump
FCU2.13	PCC.I2.27	PCC Deputy	1	2,10 kW	2,2 kW	131 l/s	230, 1, 50	0,40 A	TROX	PWX-60/1-F7	Individual remote wall mounted temperature controllers, each unit complete with return air sensor. Each unit to come complete with and integral condensate pump

PROJECT NAME Europort - PCC Building	GRILLES - SUPPLY AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Notes
					mmØ or mm x mm					
SG0.25	PCC.LO.01	Nurse Base	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.LO.02	Store								
SG0.01	PCC.LO.04	Dist. Nurse	158 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.03	PCC.LO.05	Sister's Office	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.04	PCC.LO.06	Nurse Practitioner	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.05	PCC.LO.07	GP Clinic	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.06	PCC.LO.08	GP Clinic 2	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.07	PCC.LO.09	GP Clinic 3	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.08	PCC.LO.10	GP Clinic 4	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.09	PCC.LO.11	GP Clinic 5	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.10	PCC.LO.12	GP Clinic 6	131 l/s	Square Diffuser	600x601	2	251 mmØ	Lindab	LCP-250-2	Fan Coils insufflation grilles
SG0.11	PCC.LO.13	GP Clinic 7	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.12	PCC.LO.14	GP Clinic 8	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.13	PCC.LO.15	GP Clinic 9	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.14	PCC.LO.16	GP Clinic 10	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.15	PCC.LO.17	GP Clinic 11	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.16	PCC.LO.18	GP Clinic 12	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.17	PCC.LO.19	GP Clinic 13	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.18	PCC.LO.20	GP Clinic 14	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.19	PCC.LO.21	GP Clinic 15	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles

PROJECT NAME	GRILLES - SUPPLY AIR	
Europort - PCC Building		

Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Notes
					mmØ or mm x mm					
SG0.20	PCC.LO.22	Nurse Practitioners Clinics	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.21	PCC.LO.23	Diabetic & Dietetics Clinics	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.22	PCC.LO.24	Diabetic & Dietetics Clinics	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.LO.25	Store								
SG0.29	PCC.LO.28	Waiting area	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.23	PCC.LO.29	Call Center	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.02	PCC.LO.30	Observation Area	158 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG0.26	PCC.LO.31	SEE & Treat Area	131 l/s	Square Diffuser	600x600	4	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.LO.32	Asssit. Shower & WC								
	PCC.LO.33	Dirty Util.								
	PCC.LO.34	Clean Util.								
SG0.32	PCC.LO.37	Beverage	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.LO.36	I.T.Room								

PROJECT NAME Europort - PCC Building	GRILLES - SUPPLY AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Notes
					mmØ or mm x mm					
SG1.01	PCC.L1.01	Hyper T	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.02	PCC.L1.02	Nurse Practitioner	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.03	PCC.L1.03	GP Clinic 16	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.04	PCC.L1.04	Kitchen / Staff	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.05	PCC.L1.05	GP Clinic 17	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.06	PCC.L1.06	GP Clinic 18	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.07	PCC.L1.07	GP Clinic 19	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.08	PCC.L1.08	GP Clinic 20	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.09	PCC.L1.09	GP Clinic 21	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.10	PCC.L1.10	GP Clinic 22	131 l/s	Square Diffuser	600x601	2	251 mmØ	Lindab	LCP-250-2	Fan Coils insufflation grilles
SG1.11	PCC.L1.11	Dermatology Minor Op Clinic	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.12	PCC.L1.12	PUVA	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.13	PCC.L1.13	Derma 1	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.14	PCC.L1.14	Derma 2	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.15	PCC.L1.15	GP Clinic 24	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.16	PCC.L1.16	GP Clinic 25	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.17	PCC.L1.17	GP Clinic 26	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.18	PCC.L1.18	GP Clinic 27	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.19	PCC.L1.19	GP Clinic 28	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.20	PCC.L1.20	GP Clinic 29	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.21	PCC.L1.21	Medical Secretaries	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.L1.22	Dis. Toilet 1								

PROJECT NAME Europort - PCC Building	GRILLES - SUPPLY AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Notes
					mmØ or mm x mm					
	PCC.L1.23	Toilet 1								
SG1.22	PCC.L1.24	Waiting Area	158 l/s	Square Diffuser	600x600	4	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.23	PCC.L1.25	Reception	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG1.24	PCC.L1.26	Nurse Base	131 l/s	Square Diffuser	600x600	2	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.L1.27	Clean Utility								
	PCC.L1.28	Dirty Utility								

PROJECT NAME Europort - PCC Building	GRILLES - SUPPLY AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Notes
					mmØ or mm x mm					
SG2.01	PCC.L2.01	Councillor's Clinic 1	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.02	PCC.L2.02	Councillor's Clinic 2	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.03	PCC.L2.03	Councillor's Clinic 3	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.04	PCC.L2.04	Well Man / Well Woman 1	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.05	PCC.L2.05	Well Man / Well Woman 2	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.06	PCC.L2.06	Well Man / Well Woman 3	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.07	PCC.L2.07	Community Midwife	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.08	PCC.L2.08	Dr. Vassallo Clinic	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.09	PCC.L2.09	Dietician	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.10	PCC.L2.10	Board Room	211 l/s	Square Diffuser	600x601	2	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.11	PCC.L2.11	Beverage	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.L2.12	Dis. Toilet 1								
	PCC.L2.13	Toilet 2								
SG2.22	PCC.L2.14	Waiting Area	158 l/s	Square Diffuser	600x600	4	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.23	PCC.L2.15	Admin	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.L2.16	Dirty Util.								
	PCC.L2.17	Clean Store								
SG2.24	PCC.L2.18	Finance Admin.	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.20	PCC.L2.19	Mental Health Waiting Area	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
	PCC.L2.20	Store								
SG2.19	PCC.L2.21	Mental Health Clinic 1	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.18	PCC.L2.22	Mental Health Clinic 2	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles

PROJECT NAME Europort - PCC Building	GRILLES - SUPPLY AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size	Qty	Connection Size to Grille mmØ or mm x mm	Manufacturer	Model	Notes
					mmØ or mm x mm					
SG2.17	PCC.L2.23	Mental Health Clinic 3	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.16	PCC.L2.24	Councillor's	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.15	PCC.L2.25	Clinical Nurse Manager	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.14	PCC.L2.26	PCC director	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.13	PCC.L2.27	PCC Deputy	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles
SG2.12	PCC.L2.28	PCC Manager	131 l/s	Square Diffuser	600x600	1	250 mmØ	Lindab	LCP-250-1	Fan Coils insufflation grilles

PROJECT NAME Europort - PCC Building	GRILLES - EXTRACT AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size		Manufacturer	Model	Note
					mmØ or mm x mm	Qty			
EG0.25	PCC.LO.01	Nurse Base		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.33	PCC.LO.02	Store		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.01	PCC.LO.04	Dist. Nurse		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.03	PCC.LO.05	Sister's Office		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.04	PCC.LO.06	Nurse Practitioner		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.05	PCC.LO.07	GP Clinic		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.06	PCC.LO.08	GP Clinic 2		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.07	PCC.LO.09	GP Clinic 3		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.08	PCC.LO.10	GP Clinic 4		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.09	PCC.LO.11	GP Clinic 5		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.10	PCC.LO.12	GP Clinic 6		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.11	PCC.LO.13	GP Clinic 7		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.12	PCC.LO.14	GP Clinic 8		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.13	PCC.LO.15	GP Clinic 9		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.14	PCC.LO.16	GP Clinic 10		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.15	PCC.LO.17	GP Clinic 11		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.16	PCC.LO.18	GP Clinic 12		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.17	PCC.LO.19	GP Clinic 13		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.18	PCC.LO.20	GP Clinic 14		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.19	PCC.LO.21	GP Clinic 15		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.20	PCC.LO.22	Nurse Practitioners Clinics		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.21	PCC.LO.23	Diabetic & Dietetics Clinics		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.22	PCC.LO.24	Diabetic & Dietetics Clinics		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.34	PCC.LO.25	Store		Extract Valve	diam.150	1	Koolair	GPD	Open grills with no plenum box to exhaust air to the ceiling void to EGs

PROJECT NAME Europort - PCC Building	GRILLES - EXTRACT AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size		Manufacturer	Model	Note
					mmØ or mm x mm	Qty			
EG0.29	PCC.LO.28	Waiting area		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.23	PCC.LO.29	Call Center		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.02	PCC.LO.30	Observation Area		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.26	PCC.LO.31	SEE & Treat Area		Square Extract Grile	600x600	4	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
TEF0.01	PCC.LO.32	Asssit. Shower & WC		Extract Valve	diam.150	1	Koolair	GPD	
EG0.30	PCC.LO.33	Dirty Util.		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.31	PCC.LO.34	Clean Util.		Extract Valve	diam.150	1	Koolair	GPD	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG0.32	PCC.LO.37	Beverage		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
	PCC.LO.36	I.T.Room							

PROJECT NAME Europort - PCC Building	GRILLES - EXTRACT AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size		Manufacturer	Model	Note
					mmØ or mm x mm	Qty			
EG1.01	PCC.L1.01	Hyper T		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.02	PCC.L1.02	Nurse Practitioner		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.03	PCC.L1.03	GP Clinic 16		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.04	PCC.L1.04	Kitchen / Staff		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.05	PCC.L1.05	GP Clinic 17		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.06	PCC.L1.06	GP Clinic 18		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.07	PCC.L1.07	GP Clinic 19		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.08	PCC.L1.08	GP Clinic 20		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.09	PCC.L1.09	GP Clinic 21		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.10	PCC.L1.10	GP Clinic 22		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.11	PCC.L1.11	Dermatology Minor Op Clinic		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.12	PCC.L1.12	PUVA		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.13	PCC.L1.13	Derma 1		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.14	PCC.L1.14	Derma 2		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.15	PCC.L1.15	GP Clinic 24		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.16	PCC.L1.16	GP Clinic 25		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.17	PCC.L1.17	GP Clinic 26		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.18	PCC.L1.18	GP Clinic 27		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.19	PCC.L1.19	GP Clinic 28		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.20	PCC.L1.20	GP Clinic 29		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.21	PCC.L1.21	Medical Secretaries		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
TEF1.02	PCC.L1.22	Dis. Toilet 1		Extract Valve	diam.100	1	Koolair	GPD	
TEF1.01	PCC.L1.23	Toilet 1		Extract Valve	diam.100	1	Koolair	GPD	
EG1.22	PCC.L1.24	Waiting Area		Square Extract Grille	600x600	3	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.23	PCC.L1.25	Reception		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs

PROJECT NAME Europort - PCC Building	GRILLES - EXTRACT AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size		Manufacturer	Model	Note
					mmØ or mm x mm	Qty			
EG1.24	PCC.L1.26	Nurse Base		Square Extract Grile	600x600	2	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.25	PCC.L1.27	Clean Utility		Extract Valve	diam.150	1	Koolair	GPD	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG1.26	PCC.L1.28	Dirty Utility		Extract Valve	diam.150	1	Koolair	GPD	Open grills with no plenum box to exhaust air to the ceiling void to EGs

PROJECT NAME Europort - PCC Building	GRILLES - EXTRACT AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size		Manufacturer	Model	Note
					mmØ or mm x mm	Qty			
EG2.01	PCC.L2.01	Councillor's Clinic 1		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.02	PCC.L2.02	Councillor's Clinic 2		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.03	PCC.L2.03	Councillor's Clinic 3		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.04	PCC.L2.04	Well Man / Well Woman 1		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.05	PCC.L2.05	Well Man / Well Woman 2		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.06	PCC.L2.06	Well Man / Well Woman 3		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.07	PCC.L2.07	Community Midwife		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.08	PCC.L2.08	Dr. Vassallo Clinic		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.09	PCC.L2.09	Dietician		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.10	PCC.L2.10	Board Room		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.11	PCC.L2.11	Beverage		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
TEF2.02	PCC.L2.12	Dis. Toilet 1		Extract Valve	diam.100	1	Koolair	GPD	
TEF2.01	PCC.L2.13	Toilet 2		Extract Valve	diam.100	1	Koolair	GPD	
EG2.22	PCC.L2.14	Waiting Area		Square Extract Grille	600x600	4	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.23	PCC.L2.15	Admin		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.26	PCC.L2.16	Dirty Util.		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.27	PCC.L2.17	Clean Store		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.24	PCC.L2.18	Finance Admin.		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.20	PCC.L2.19	Mental Health Waiting Area		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.28	PCC.L2.20	Store		Extract Valve	diam.150	1	Koolair	GPD	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.19	PCC.L2.21	Mental Health Clinic 1		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.18	PCC.L2.22	Mental Health Clinic 2		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.17	PCC.L2.23	Mental Health Clinic 3		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.
EG2.16	PCC.L2.24	Councillor's		Square Extract Grille	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs.

PROJECT NAME Europort - PCC Building	GRILLES - EXTRACT AIR	
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Ref	Location	Location	Air Volume l/s	Type	Size		Manufacturer	Model	Note
					mmØ or mm x mm	Qty			
EG2.15	PCC.L2.25	Clinical Nurse Manager		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG2.14	PCC.L2.26	PCC director		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG2.13	PCC.L2.27	PCC Deputy		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs
EG2.12	PCC.L2.28	PCC Manager		Square Extract Grile	600x600	1	Lindab	PCY Size 600	Open grills with no plenum box to exhaust air to the ceiling void to EGs

PROJECT NAME

Drainage Pump Grundfos



Europort - PCC Building

Ref	Location	Location	Type	Electrical Supply Details (V,Ø,HZ)	Manufacturer & Model
	PCC.LO.01	Nurse Base			
	PCC.LO.04	Dist. Nurse			
	PCC.LO.05	Sister's Office			
	PCC.LO.06	Nurse Practitioner			
	PCC.LO.07	GP Clinic			
	PCC.LO.08	GP Clinic 2			
	PCC.LO.09	GP Clinic 3			
	PCC.LO.10	GP Clinic 4			
	PCC.LO.11	GP Clinic 5			
DP02	PCC.LO.12	GP Clinic 6	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	PCC.LO.13	GP Clinic 7			
DP02	PCC.LO.14	GP Clinic 8	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	PCC.LO.15	GP Clinic 9	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP02	PCC.LO.16	GP Clinic 10	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
DP01	PCC.LO.17	GP Clinic 11	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2
	PCC.LO.18	GP Clinic 12			
	PCC.LO.19	GP Clinic 13			
	PCC.LO.20	GP Clinic 14			
	PCC.LO.21	GP Clinic 15			
	PCC.LO.22	Nurse Practitioners Clinics			
	PCC.LO.23	Diabetic & Dietetics Clinics			
	PCC.LO.24	Diabetic & Dietetics Clinics			
	PCC.LO.28	Waiting area			
	PCC.LO.29	Call Center			
	PCC.LO.30	Observation Area			
	PCC.LO.31	SEE & Treat Area			
DP01	PCC.LO.37	Beverage	GRUNDFOS - D-2	230, 1, 50	SOLOLIFT2

Filters	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual		X				

Ducts diffusers elements and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Ducts						
Corrosion verification and insulation application.				X		
Internal inspection and cleaning.				X		
Flows check and compare with design.				X		
Fire dampers						
Working test.				X		
Check that damper stays open after inspection.				X		
Diffusion, return and air extraction air elements						
Surface cleaning with soft humid cloth				X		
Check airflows and compare with design.				X		

Hydraulic networks components and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Piping						
Brine leakage verification.	X					
Verification of corrosion, insulation, painting, supports and expansion joints.			X			
Air vents verification and filling of all branches.	X					
Valves						
Corrosion verification, joints and open and closure test.		X				
Elastic coupling						
Deformation inspection and brine leakages.	X					
Vessels						
Corrosion verification, insulation and inner cleaning.				X		
All valves working inspection.				X		
Calibrate manometers and thermometers.				X		
Closed expansion vessels						
Corrosion verification and inspect membrane.				X		
Leakages check, air pressure in chamber and safety valve.	X					
Compressor working verification.				X		
pressure switches and solenoid valves check.			X			
Water filters						
Brine leakages check and clean filter.					X	
Water flow meters						
Corrosion and brine leakage check. Metering register.	X					
Check working and measurement.					X	
Flow switches						
Corrosion check and brine leakage.	X					
Inner pipe cleaning.				X		
Electric contact tightening.				X		

Heat Exchangers	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Plate and dry coolers heat exchangers	X					
Check corrosion points, deformation, water leaks and cleaning.	X					
Thermal insulation state check.				X		
Opening, plate cleaning, substitution of damage plates and joints.				X		
Check tightness verification between primary and secondary circuit.		X				

Batteries	Frequency [months]					Notes
	1	3	6	12	24	
Corrosion and oxidation inspection, cleaning and painting.				X		
Internal module cleaning and leakages check				X		
Air vents cleaning check.		X				
Check state and working of automatic valves and filters.			X			
Check anti ice system				X		
Cleaning and working check of condensate pans and siphons.			X			
Electric batteries working check, cabling and mechanical latching.	X					

Fan coils (internal units)	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Water and gas leaks check.	X					
Control systems check, thermostatic valves and air vents.			X			
Check gas temperature and ambient, compare with design.			X			

In Rak 300mm - Server Room	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Water and gas leaks check.	X					
Control systems check, thermostatic valves and air vents.			X			
Check gas temperature and ambient, compare with design.			X			

Switchboards	Frequency [months]					Notes
	1	3	6	12	24	
Switchboard general cleaning and corrosion points repair.				X		
Test and cleaning of all equipment and switchboard components.		X				
test and adjustment of measure equipment.		X				
Terminals tightening.	X					
Earth measurement.		X				
Thermographic verification				X		
Measuring of tension and intensity of all circuits.		X				
Electric isolation verification and supply cabling to equipment.				X		

AHU-2	Periodicidade [Meses]					Observações
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Free cooling module						
Check the operation of registers and servomotors			X			
Checking circuits and electrical equipment, terminal tightening			X			
Measurement of airflows and comparison with design values			X			
Filter module						
Check routines indicated on specific O&M manual						
Power recovery module						
Check routines listed in Heat Exchangers						
Air Treatment Batteries Module						
Check routines listed in Batteries						
Ventilation module						
Check for noise, vibration and direction of rotation		X				
Check motors for operation		X				
Check the of control, command and safety equipment		X				
Checking electrical insulation, tightening terminals				X		
Measurement of operating voltages and currents	X					
Recording operating data and compare with project			X			
Determine yields of the various sections and compare with project			X			

Fans	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion, cleaning and boxes general state.				X		
Airtightness panels verification.			X			
Corrosion verification, cleaning and fans lubrication.				X		
Verification of abnormal noises and vibrations.		X				
Clearance and alignment transmission check.	X					
Tightening of electrical devices and conductor and isolation check.				X		
Check the actuation of latching systems and protection.	X					
Working condition check and comparison with design.	X					
Check electric motors consumption and compare with nominal condition.	X					

Pumps	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check for corrosions, cleaning and general state.				X		
Check of anti vibration mounts and supports.				X		
Check lubrication level, coupling and gaskets.		X				
Water leaks check and abnormal noises vibrations and overheating.	X					
Check electrical connection tightness and motor working.		X				
Check working conditions and compare with design.	X					
Check tension and consumption and compare with nominal conditions.	X					

Ducts diffusers elements and accessories	Frequency [months]					Notes
	1	3	6	12	24	
Ducts						
Corrosion verification and insulation application.				X		
Internal inspection and cleaning.				X		
Flows check and compare with design.				X		
Fire dampers						
Working test.				X		
Check that damper stays open after inspection.				X		
Diffusion, return and air extraction air elements						
Surface cleaning with soft humid cloth				X		
Check airflows and compare with design.				X		

Fan coils (internal units)	Frequency [months]					Notes
	1	3	6	12	24	
Check routines indicated on specific O&M manual						
Check corrosion points and cleaning.				X		
Water leaks check.	X					
Control systems check, thermostatic valves and air vents.			X			
Check water temperature and ambient, compare with design.			X			

BUILDING INFORMATION

NAME: EUROPORT

REF: PCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : PUBLIC HEALTH

INSTALLATION TYPE : COLD WATER | HOT WATER |

PIPE TYPE : UPONOR MULTILAYER PIPE 16mm, 20mm, 25mm e 32mm

LEVEL/RISING: Gound Floor

LOCATION : _____

Test Fluid:

WATER

Test Pressure:

12

[bar]

Duration Test:

1 hr

Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
31/07/2019 10:00	12 bar	31/07/2019 11:00	12 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

BUILDING INFORMATION

NAME: EUROPORT

REF: PCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : PUBLIC HEALTH

INSTALLATION TYPE : COLD WATER | HOT WATER |

PIPE TYPE : UPONOR MULTILAYER PIPE 16mm, 20mm, 25mm e 32mm

LEVEL/RISING: First Floor

LOCATION : _____

Test Fluid:

WATER

Test Pressure:

9

[bar]

Duration Test:

1 hr

Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
21/08/2019 10:00	9 bar	21/08/2019 11:00	9 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

BUILDING INFORMATION

NAME: EUROPORT

REF: PCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : PUBLIC HEALTH

INSTALLATION TYPE : COLD WATER | HOT WATER |

PIPE TYPE : UPONOR MULTILAYER PIPE 16mm, 20mm, 25mm e 32mm

LEVEL/RISING: Second Floor

LOCATION : _____

Test Fluid:

WATER

Test Pressure:

7

[bar]

Duration Test:

1 hr

Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
04/07/2019 10:00	7 bar	04/07/2019 11:00	7 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

BUILDING INFORMATION

NAME: **EUROPORT**

REF: **PCC**

CLIENT:

INSTALLATION INFORMATION

TRADE : **PUBLIC HEALTH**

INSTALLATION TYPE : **DRAINAGE WATER - RISERS / RAINWATER**

PIPE TYPE : **PVC-U / Pluvia**

LEVEL/RISING:

LOCATION : **GROUND FLOOR**

TESTING SPECIFICATION

Test Fluid: **WATER**

Test Pressure: **1400** [mmH2O]

Duration Test: **30min**

Max Error Margin **1** [%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
03/12/2018 14:00:00	1400 mm	03/12/2018 14:30:00	1400 mm		

NOTES



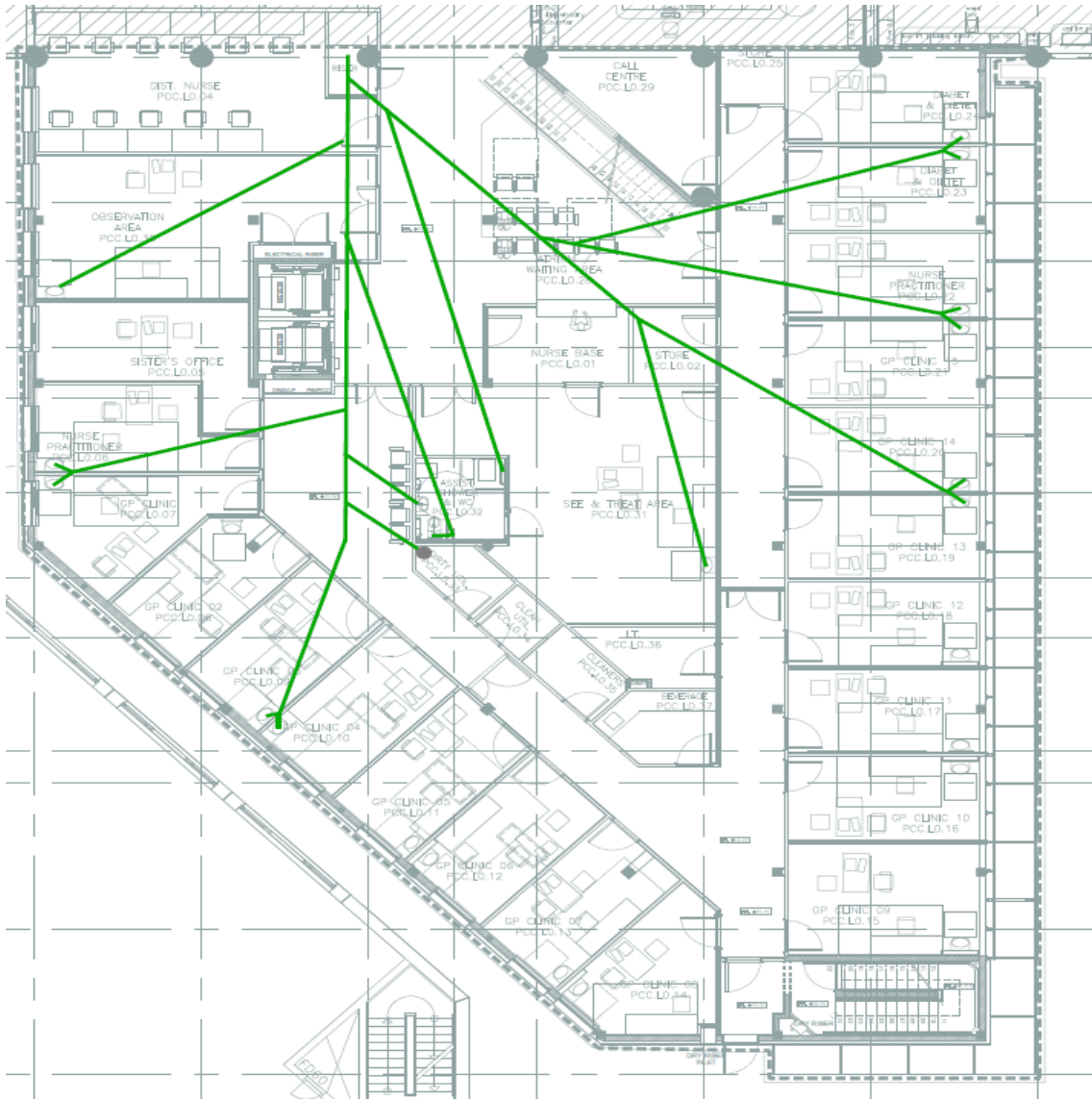
VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____ Date: _____

CLIENT BEHALF : _____ Date: _____

CLIENT BEHALF : _____ Date: _____



BUILDING INFORMATION

NAME: **EUROPORT**

REF: **PCC**

CLIENT:

INSTALLATION INFORMATION

TRADE : **MECHANICAL**

INSTALLATION TYPE : **HVAC Galvanized steel**

PIPE TYPE : **Galvanized steel**

LEVEL/RISING:

LOCATION : **Basement - Chilled Water -**

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10,00

[bar]

Duration Test:

24HORAS

Max Error Margin

1%

[%]

Supply

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
3/09/2019 - 10:00	10,00 bar	4/09/2019 -10:00	10,00 bar		

Return

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
3/09/2019 - 12:00	10,00 bar	4/09/2019 -12:00	10,00 bar		

NOTES


Supply

Return

VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

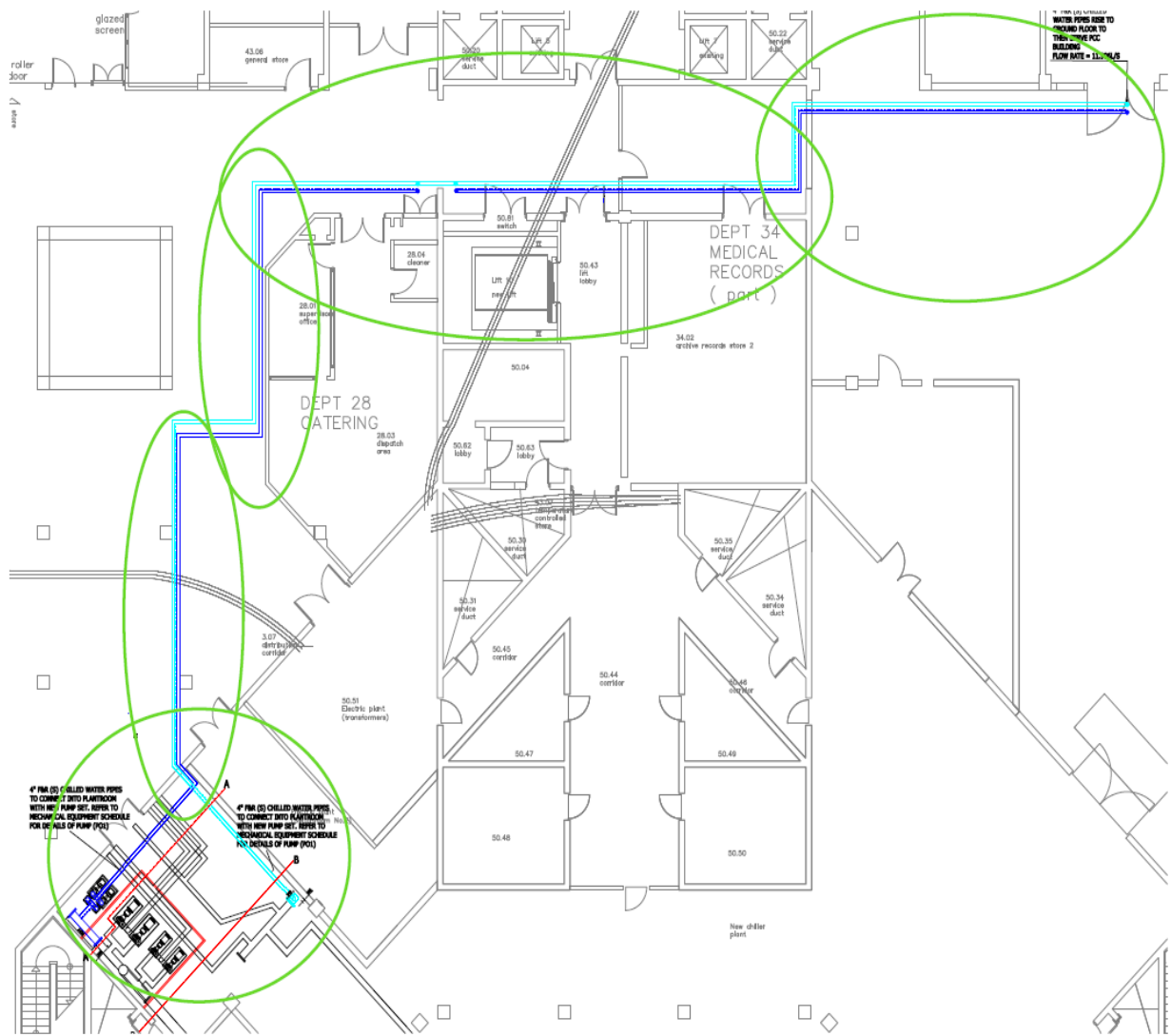
Date:

CLIENT BEHALF :

Date:

CLIENT BEHALF :

Date:



BUILDING INFORMATION

NAME: **EUROPORT**

REF: **PCC**

CLIENT:

INSTALLATION INFORMATION

TRADE : **MECHANICAL**

INSTALLATION TYPE : **HVAC Galvanized steel**

PIPE TYPE : **Galvanized steel**

LEVEL/RISING:

LOCATION : **Ground Floor- Chilled Water -**

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10,50

[bar]

Duration Test:

24HORAS

Max Error Margin

1%

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
23/07/2019 - 10:00	10,50 bar	24/07/2019 - 10:00	10,50 bar		

NOTES

Imagem



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date:

CLIENT BEHALF :

Date:

CLIENT BEHALF :

Date:

BUILDING INFORMATION

NAME: **EUROPORT**

REF: **PCC**

CLIENT:

INSTALLATION INFORMATION

TRADE : **MECHANICAL**

INSTALLATION TYPE : **HVAC Galvanized steel**

PIPE TYPE : **Galvanized steel**

LEVEL/RISING:

LOCATION : **Second Floor- Chilled Water -**

TESTING SPECIFICATION

Test Fluid:

WATER

Test Pressure:

10,00

[bar]

Duration Test:

24HORAS

Max Error Margin

1%

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
04/07/2019 - 10:00	10,00 bar	05/07/2019 - 10:00	10,00 bar		

NOTES

Imagem



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date:

CLIENT BEHALF :

Date:

CLIENT BEHALF :

Date:

BUILDING INFORMATION

NAME: EUROPORT

REF: PCC

CLIENT: _____

INSTALLATION INFORMATION

TRADE : PUBLIC HEALTH

INSTALLATION TYPE : SALT WATER

PIPE TYPE : CPVC HTA PIPE 16mm, 20mm e 25mm

LEVEL/RISING: Gound floor; First Floor; Second Floor

LOCATION : _____

Test Fluid:

WATER

Test Pressure:

10

[bar]

Duration Test:

1 hr

Max Error Margin

1

[%]

INITIAL DATE/HOUR	INITIAL VALUE	FINAL DATE/HOUR	FINAL VALUE	APPROVED	NOT APPROVED
09/09/2019 16:00	10 bar	09/09/2019 17:00	10 bar		

NOTES



VALIDATION

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

CLIENT BEHALF : _____

Date: _____

BUILDING INFORMATIONNAME: EUROPORTREF: PCC

CLIENT: _____

INSTALLATION INFORMATIONTRADE : MECHANICALINSTALLATION TYPE : Ventilation SystemsPIPE TYPE : Circular Spiral DuctsLEVEL/RISING: Ground Floor

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

400

[Pa]

Duration Test:

5min

Max Error Margin

1

[%]

INITIAL DATE/HOUR		INITIAL VALUE	FINAL DATE/HOUR		FINAL VALUE	APPROVED	NOT APPROVED
03/08/2019	11:31:00	400 Pa	03/08/2019	11:36:00	400 Pa		

NOTES**VALIDATION**

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date: _____

CLIENT BEHALF :

Date: _____

CLIENT BEHALF :

Date: _____

Leakage test

Project

Customer name	PCC Ground Floor	Wöhler DP 700 1.04
Customer number	1	Serial No. 1199
Duct	EXTRACT DUCT	Calibration date 19/10/2018

Leakage test report of air ducts in accordance to EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date	03/08/2019
Measuring time	11:31

Presettings

Surface area	20 m ²
Tightness class	D
Rate factor	1 l/(s m ²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	401 Pa
Leakage rate	0.1013 l/s
Duration	00:05:00 min

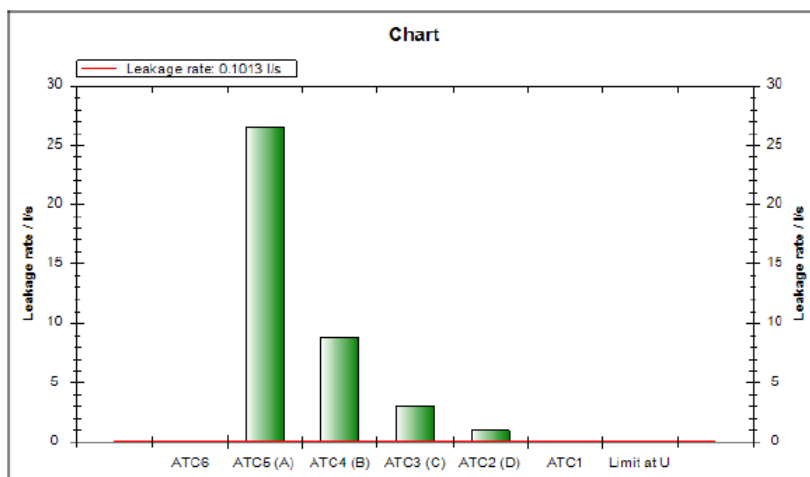
Result

Test passed.

Remarks

Limits

ATC6	
ATC5 (A)	26.555 l/s
ATC4 (B)	8.8519 l/s
ATC3 (C)	2.9506 l/s
ATC2 (D)	0.9835 l/s
ATC1	
Limit at U	0.0197 l/s



Date 03/08/2019

Signature

BUILDING INFORMATIONNAME: EUROPORTREF: PCC

CLIENT: _____

INSTALLATION INFORMATIONTRADE : MECHANICALINSTALLATION TYPE : Ventilation SystemsPIPE TYPE : Circular Spiral DuctsLEVEL/RISING: First Floor

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

400

[Pa]

Duration Test:

5min

Max Error Margin

1

[%]

INITIAL DATE/HOUR		INITIAL VALUE	FINAL DATE/HOUR		FINAL VALUE	APPROVED	NOT APPROVED
03/08/2019	12:19:00	400 Pa	03/08/2019	12:26:00	400 Pa		

NOTES**VALIDATION**

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date: _____

CLIENT BEHALF :

Date: _____

CLIENT BEHALF :

Date: _____

Leakage test

Project

Customer name	PCC First Floor	Wöhler DP 700 1.04
Customer number	2	Serial No. 1199
Duct	EXTRACT DUCT	Calibration date 19/10/2018

Leakage test report of air ducts in accordance to EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date	03/08/2019
Measuring time	12:19

Presettings

Surface area	20 m ²
Tightness class	D
Rate factor	1 l/(s m ²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	401 Pa
Leakage rate	0.1004 l/s
Duration	00:05:00 min

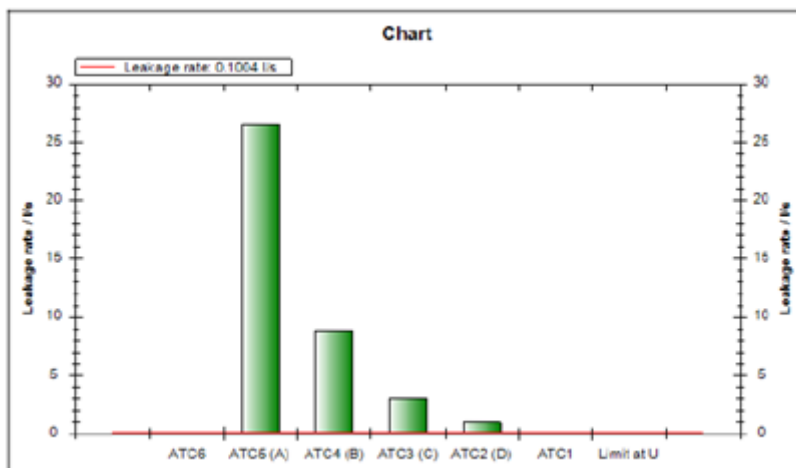
Result

Test passed.

Remarks

Limits

ATC6	
ATC5 (A)	26.551 l/s
ATC4 (B)	8.8504 l/s
ATC3 (C)	2.9501 l/s
ATC2 (D)	0.9834 l/s
ATC1	
Limit at U	0.0197 l/s



Date 03/08/2019

Signature

BUILDING INFORMATIONNAME: EUROPORTREF: PCC

CLIENT: _____

INSTALLATION INFORMATIONTRADE : MECHANICALINSTALLATION TYPE : Ventilation SystemsPIPE TYPE : Circular Spiral DuctsLEVEL/RISING: Second Floor

LOCATION : _____

TESTING SPECIFICATION

Test Fluid:

AIR

Test Pressure:

400

[Pa]

Duration Test:

5min

Max Error Margin

1

[%]

INITIAL DATE/HOUR		INITIAL VALUE	FINAL DATE/HOUR		FINAL VALUE	APPROVED	NOT APPROVED
03/08/2019	10:21:00	400 Pa	03/08/2019	10:26:00	400 Pa		

NOTES**VALIDATION**

The foregoing pipework has been satisfactorily tested, in accordance with the above requirements, in the presence of

CASAIS :

Date: _____

CLIENT BEHALF :

Date: _____

CLIENT BEHALF :

Date: _____

Leakage test

Project

Customer name	PCC Second Floor	Wöhler DP 700 1.04
Customer number	3	Serial No. 1199
Duct	SUPPLY DUCT	Calibration date 19/10/2018

Leakage test report of air ducts in accordance to EN 12237, EN 1507, EN 12599 and EN 16798-3

Measuring date	03/08/2019
Measuring time	10:21

Presettings

Surface area	40 m ²
Tightness class	D
Rate factor	1 l/(s m ²)
Adapter type	0.3
Pressure	400 Pa

Measuring values

Test pressure	402 Pa
Leakage rate	0.2589 l/s
Duration	00:05:00 min

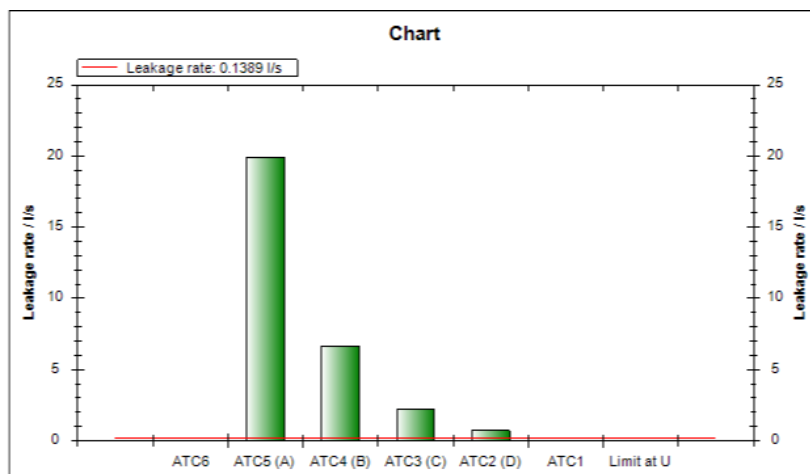
Result

Test passed.

Remarks

Limits

ATC6	
ATC5 (A)	19.939 l/s
ATC4 (B)	6.6464 l/s
ATC3 (C)	2.2155 l/s
ATC2 (D)	0.7385 l/s
ATC1	
Limit at U	



Date 03/08/2019

Signature