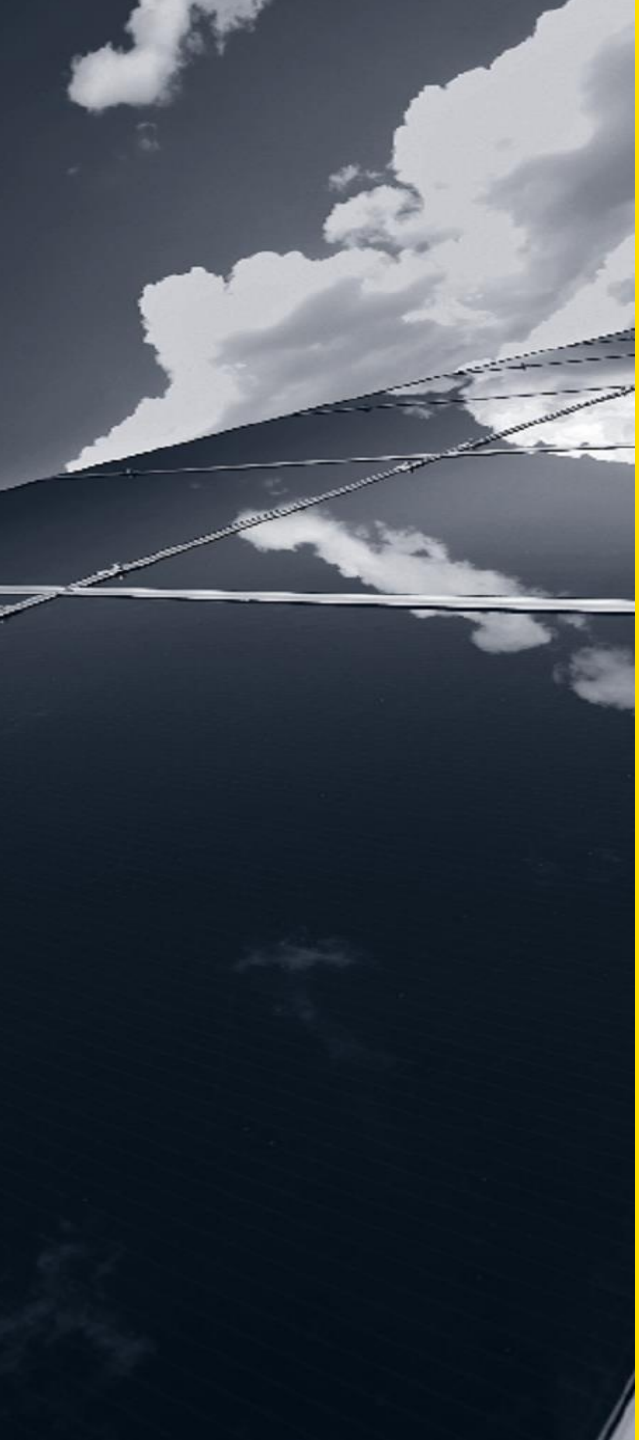


Western Balkans Investment Framework WBIF

ces CLEAN ENERGY SOLUTIONS

iC consulenten

EE measures and Implementation - Trainings Program for Construction Companies and Supervisors

Commissioning

10/11/2016

Commissioning process

The commissioning process is intended to verify that the installation and performance of the selected building systems meet the specified **design criteria** and to verify that the **design intent** has been met.

Commissioning

Main objectives:

- Ensure that MEP equipment and systems are installed properly and in accordance with design documents and performance requirements
- Verification and reporting on performance of systems and equipment
- Review and ensure that all Operation and Maintenance documents (O&M) are complete. Within this, verify if manufactures and contractors warranties meet the requirements in the specification and contracts documents
- Review and ensure that all as-built documentation is complete and accurate

Commissioning Plan

- Provide project specific commissioning process guidelines for the commissioning team, to assure compliance with the design, specifications and contract in general
- Define team members for the commissioning process, incl. respective roles and responsibilities
- Define the exact schedules for verification and functional performance testing
- Define procedures for reporting and rectification of possible defects and deficiencies that might be identified
- Define training programme for operations and maintenance staff

Testing vs. Commissioning

TESTING:

Static tests undertaken during the services installations, to prove quality of the installations e.g.:

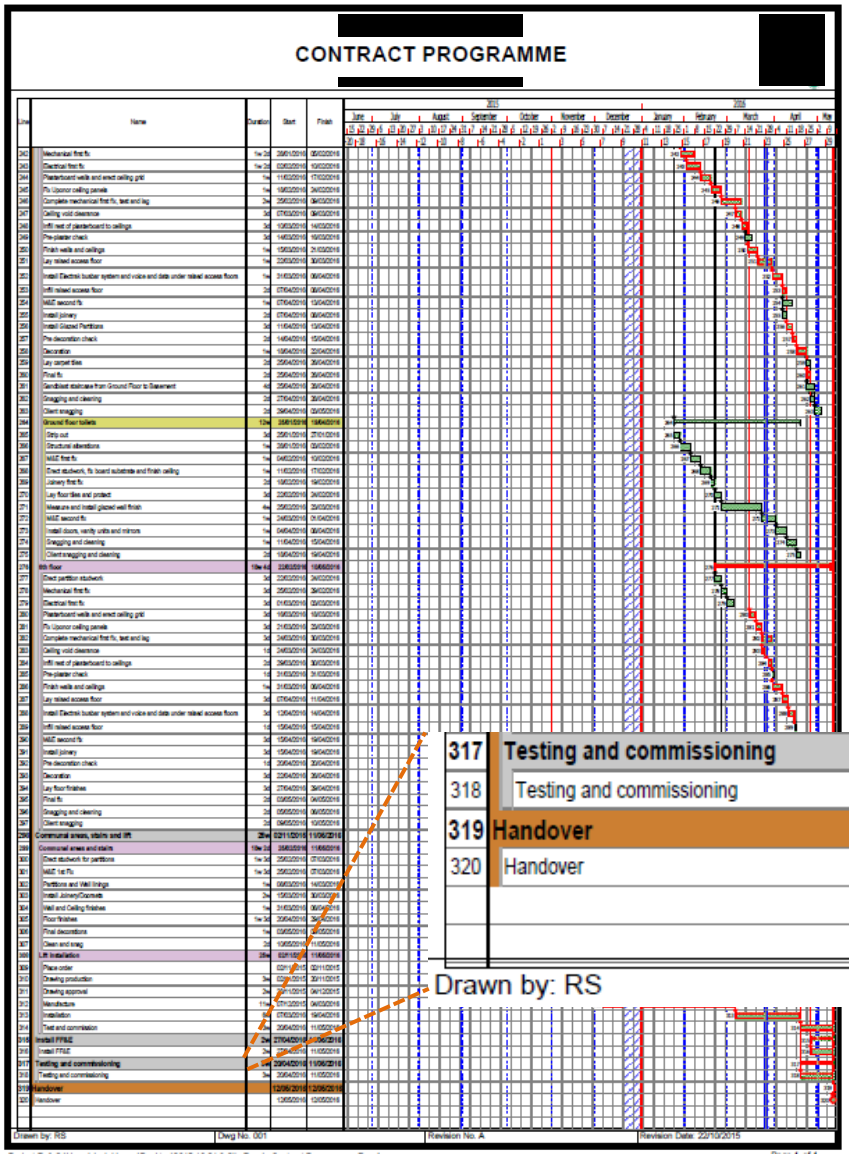
- Pressure testing for ductwork and pipework
- Resistance checks for cabling

COMMISSIONING:

Process of undertaking dynamic testing, e.g. balancing, volume testing etc. Carried out to prove that the systems operate and perform to the design intent and specification

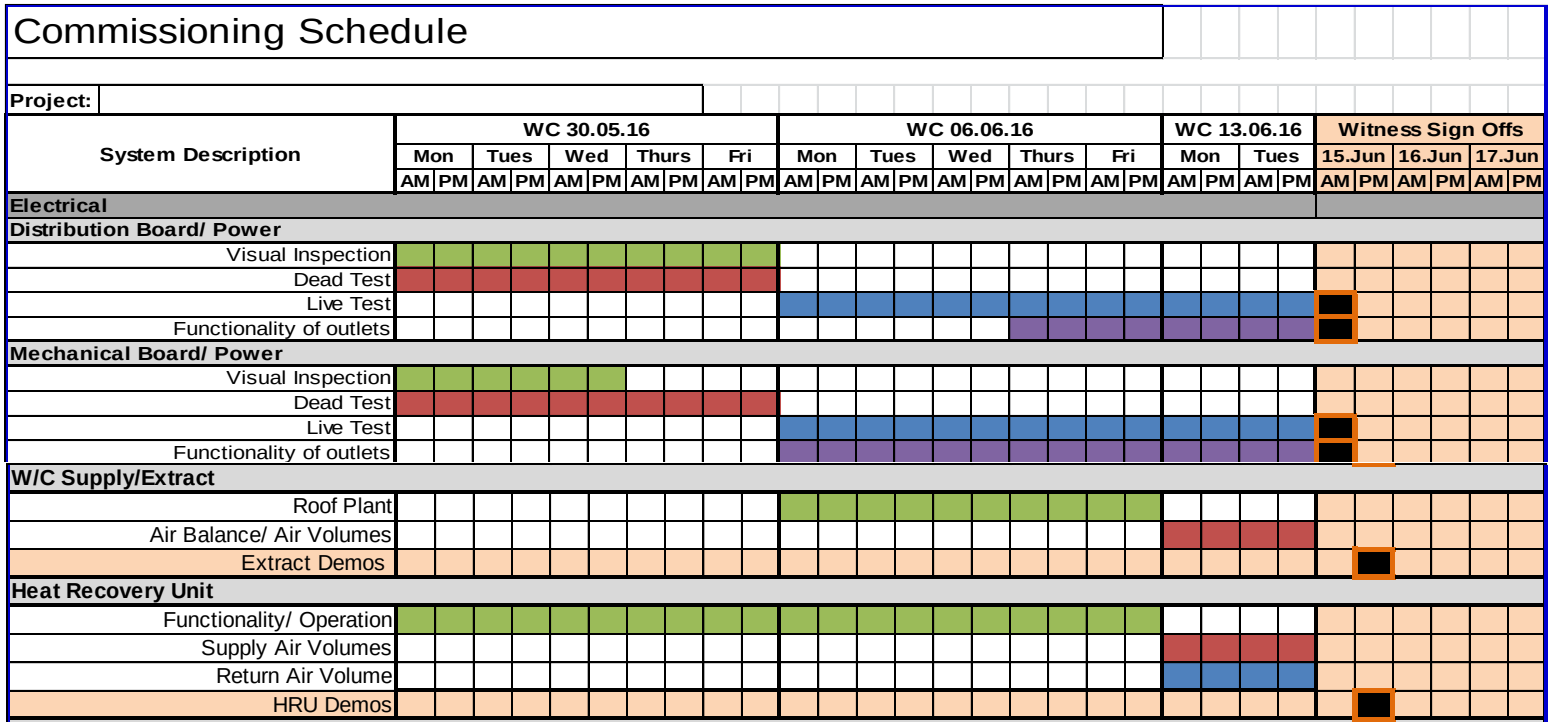
Performance testing: often carried out when the building is already occupied to check performance in different weather conditions. For some facilities this all year conditions need to be simulated prior to handover, e.g. server rooms.

Commissioning plan Examples



317	**Testing and commissioning**	**3w**	**20/04/2016**	**11/05/2016**
318	Testing and commissioning	3w	20/04/2016	11/05/2016
319	**Handover**		**12/05/2016**	**12/05/2016**
320	Handover		12/05/2016	12/05/2016

Drawn by: RS | Dwg No. 001 | Rev



- General project information
- Define comm. team
- Roles and responsibilities
- Create plan of activities

CommissioningExamples

AAC MECHANICAL & ELECTRICAL LTD
UNIT 6, MALLOW PARK, WATCHMEAD, WELWYN GARDEN CITY, HERTS AL7 1GX
TEL: 01707 32 55 66 FAX: 01707 32 55 44
EMAIL: INFO@AAC.UK.NET WWW.AAC.UK.NET

Lux Level Measurement Sheet

Address: 8 City Road, London, EC1Y 2AA Date: 20/07/2016 Time: 21.30

Engineer: Adam Males Test Instrument: KEW337 Serial No: 150204540

Ground Floor

Room	Position 1	Lux	Position 2	Lux	Position 3	Lux	Note
Entrance Corridor	By Entrance	110.2	Outside Disabled W/C	109.9	Bottom Staircase corridor	157.2	Note
Main Area	Sliding Door	120.4	Midway	475.4	Rear Fire Exit	91.6	2
Disabled Toilet				526.0			
Office 1				49.6			1
Office 2				110.6			1
Office 3				106.6			1
Office 4				91.2			1, 3

1st Floor

Room	Position 1	Lux	Position 2	Lux	Position 3	Lux	Note
Staircase 1	Bottom Landing	377.1	Mid Staircase	81.6	Top Landing	286.2	
Staircase 2	Bottom Landing	284.7	Mid Staircase	83.5	Top Landing	303.6	
Main Area	Front Window	128.7	Middle	278.4	Back Window	143.6	1
Toilet	Male	16.16	Basin	602.1	Female	17.13	3

2nd Floor

Room	Position 1	Lux	Position 2	Lux	Position 3	Lux	Note
Staircase 1	Bottom Landing	286.2	Mid Staircase	84.8	Top Landing	289.7	
Staircase 2	Bottom Landing	303.6	Mid Staircase	83.6	Top Landing	241.1	
Main Area	Front Window	129.4	Middle	294.6	Back Window	141.2	1
Toilet	Male	18.38	Basin	601.0	Female	18.57	3

3rd Floor

Room	Position 1	Lux	Position 2	Lux	Position 3	Lux	Note
Staircase 1	Bottom Landing	289.7	Mid Staircase	86.6	Top Landing	274.7	

Content

AIR DISTRIBUTION SHEET

Client;
Contract;
Contract No;
Date;
System;

Floor; General areas
Drwng No; N/a
Instrument; Testo Vane Anemome
Area served; General areas

Grille Reference	Location	Width	Depth	Diameter	Area	Design Vol L/s	Design Vel	Measured Vel	Measured Vol L/s	% of Design	Comments
Level 5											
EG/1	Bathroom 1	N/a	N/a	100dia	0.008	10	1.25	1.5	26	120%	
EG/2	WC 1	N/a	N/a	100dia	0.008	10	1.25	1.4	11	112%	
EG/3	Bathroom 2	N/a	N/a	100dia	0.008	20	2.5	2.6	21	104%	
EG/4	WC 2	N/a	N/a	100dia	0.008	20	2.5	2.7	22	108%	
Level 4											
EG/1	WC	N/a	N/a	100dia	0.008	10	1.25	1.5	12	120%	
EG/2	WC	N/a	N/a	100dia	0.008	10	1.25	1.4	11	112%	
Level 3											
EG/1	WC	N/a	N/a	100dia	0.008	10	1.25	1.4	11	112%	
EG/2	WC	N/a	N/a	100dia	0.008	10	1.25	1.5	12	120%	
Level 2											
EG/1	WC	N/a	N/a	100dia	0.008	10	1.25	1.5	11	120%	
EG/2	WC	N/a	N/a	100dia	0.008	10	1.25	1.5	12	120%	
Level 1											
EG/1	WC	N/a	N/a	100dia	0.008	10	1.25	1.4	11	112%	
EG/2	WC	N/a	N/a	100dia	0.008	10	1.25	1.4	11	112%	
Level - 1											
EG/1	WC	N/a	N/a	100dia	0.008	20	2.5	2.6	21	104%	
EG/2	Shower	N/a	N/a	100dia	0.008	20	2.5	2.7	22	108%	

Commissioning report

The final commissioning report contains the following information, but not limited to:

- Commissioning plan
- Site visit reports
- Commissioning Checklists
- Test reports and certificates
- Outstanding issues and rectification plan

Usually to be provided with the Operation and Maintenance documents O&M

Profile

i.krofak@ic-ces.at

Ivan Krofak

- Experience in international team management and project coordination in energy efficiency, renewable energy and new technologies implementation
- Team leader in sustainable design and construction and international green building development
- Experience in capacity building in developing countries
- Experience in multidisciplinary and international project engineering and management
- Expertise in sustainability analysis and evaluation of energy & ecological performance of buildings and building components, elements and structures
- Project experience across CEE

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We are looking forward
to the future.
Wherever!
Whenever!
With you.

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