



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS EP HVA 802

Documents to be supplied for Basic Engineering and Detailed Engineering

Rev.	Date	Notes
05	01/2012	Addition of documents to be supplied
04	01/2011	General updating
03	10/2008	Addition of documents
02	10/2006	Updating
00	01/2003	First issue

Owner: DEV/TEC

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1. Scope

The purpose of this document is to define the content of *HVAC* Basic Engineering and Detail Engineering studies.

The words and expressions in CAPITAL characters and *italic* are defined inside the general specification **GS EP HVA 801**.

When other words require a definition only to be used in the present document, then the definition is given in a dedicated paragraph of the present document and the defined word, when used, is marked in small and *italic* letters.

It is reminded that only Basic Engineering and Detailed Engineering studies provided by Companies listed within Company *HVAC VENDORS* list will be accepted. It is highlighted that main *CONTRACTOR* are not agreed to provide these studies excepted when listed within *HVAC VENDORS* list.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Equipment and installations shall be in accordance with (in order of precedence):

1. The country local regulations where equipment and/or installations shall be operated
2. Total General Specifications as listed in **GS EP HVA 000**
3. The International Standards
4. The French Regulation (when Country local regulation does not exist).

International System of Units (SI) shall be used.

Notes:

- In case of discrepancy between documents the more stringent requirements shall apply.
- The *HVAC VENDOR* or *CONTRACTOR* may propose proven improvements to the reference documents but shall obtain written approval of the *COMPANY* prior to implementation.
- An International Standard is a good "engineering practice" which shall be recognised and taken into consideration by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and/or *CONTRACTOR*. If required, the translation of the standards shall be included into *HVAC* scope.
- The latest revision of Standards, codes, regulations and the published errata if any shall be used and applied by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and *CONTRACTOR*.

Some documents listed hereafter are issued from the French Government and are applicable to the basic engineering, detailed engineering and construction. *ENGINEERING*, *CONTRACTOR* are in charge to translate or to entrust the translation to specialist.

**Standards**

Reference	Title
NF EN ISO/CEI 17025	General requirements for the competence of testing and calibration laboratories

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	



Total General Specifications

Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 351	External protection of structures and equipment by painting. Floating structures
GS EP EXP 101	Precommissioning and commissioning specification
GS EP EXP 103	Precommissioning and commissioning technical preparation
GS EP EXP 105	Precommissioning execution
GS EP EXP 107	Commissioning execution
GS EP HVA 000	List of HVAC specifications
GS EP HVA 100	HVAC Basis of design
GS EP HVA 461	Ductwork numbering rules
GS EP HVA 462	HVAC equipment numbering rules
GS EP HVA 801	Terminology, definitions, abbreviations
GS EP PJC 702	Requirements for Electronic Documents at Project Execution and Field Operation phases

3. Documents list

3.1 Derogations

HVAC studies, documents, equipment and construction have to be fully compliant with projects documents (including General Specifications). In case of non compliance with project documents, a derogation request has to be submitted to Company *HVAC SPECIALIST*. In case of derogation request is rejected by Company *HVAC SPECIALIST*, HVAC studies, documents, equipment and construction shall be compliant with the projects documents. In case of derogation about General Specification, the derogation shall be submitted by project to Company Technology Department, according to Company rules.

For each document to be provided during Basic Engineering and /or Detailed Engineering, a dedicated section regarding derogation(s) shall be added at end of document (mandatory). In case this section is not included within a submitted document, this document shall be rejected by Company.

This section shall include the following sub-sections:

- Approved derogation(s):

The derogation(s) already approved by Company *HVAC SPECIALIST* shall be listed. The reference to each derogation and, the general description of each derogation shall be indicated for each accepted derogation.

- Derogation(s) submitted for approval:

In case derogation is included with the document, without being approved by Company *HVAC SPECIALIST* (Head of discipline in case of derogation to a General Specification), it shall be listed in this section. The document shall be commented after the derogation has been submitted to Company *HVAC SPECIALIST*. It means that the document will be reviewed by Company under condition that derogation(s) has (have) been submitted prior to the document to be reviewed.

3.2 List of documents to be provided

The documents to be provided during Basic Engineering and Detailed Engineering are listed in the following table. The delivery of each of following document is mandatory. However, some documents could not be required due to the *HVAC* technical design of the project because of subject about they are speaking do not concern the project. Only in that case, they do not have to be provided.

The following documents have to be provided by *HVAC CONTRACTOR* during Basic and Detailed Engineering phases. One part of these documents has only to be provided during one of these two phases (refer to section "documents description").

Notes:

- The definition of the "Acceptance Class" is defined with [GS EP PJC 702](#).
- "Only for D.E." means that document has to be provided only during Detailed Engineering phase.

	Document title	Acceptance Class	Remark
HVA001	<i>HVAC</i> Master Document Register	1	
HVA002	<i>HVAC</i> design philosophy	1	
HVA003	Lists of heat gains from equipment	1	
HVA004	<i>HVAC</i> basis of design	1	
HVA005	U-value calculations	1	Only for D.E.
HVA006	Condensation risk analysis	1	Only for D.E.
HVA007	Heat gains and heat losses calculations	1	
HVA008	Leakage air flow rates calculations	1	
HVA009	Air flow rates calculations	1	
HVA010	<i>AHUs</i> and Fan coils units capacities calculations	1	
HVA011	Duct cooling coil capacities calculations	1	
HVA012	Refrigerating capacity calculations	1	
HVA013	Duct heaters capacities calculations	1	
HVA014	<i>HVAC</i> block diagrams	1	
HVA015	<i>HVAC</i> Ducting & Instrumentation Diagrams (<i>D&ID</i>), including symbols and typical	1	

	Document title	Acceptance Class	Remark
HVA016	HVAC Piping & Instrumentation Diagrams (P&ID) , including symbols and typical	1	
HVA017	HVAC sub-systems split	2	
HVA018	Single line diagrams for HVAC ducting	1	
HVA019	HVAC duct calculation note	1	
HVA020	HVAC duct to scale – Synthesis view	1	Only for D.E.
HVA021	Single lines diagrams for HVAC piping	1	Only for D.E.
HVA022	HVAC piping isometric views	2	Only for D.E.
HVA023	HVAC piping calculation note	1	Only for D.E.
HVA024	HVAC equipment tagging list	2	
HVA025	HVAC instrument tagging list	2	
HVA026	HVAC equipment and instruments name plates	1	
HVA027	HVAC ducting construction standards	1	Only for D.E.
HVA028	HVAC ducting workshop drawings	1	Only for D.E.
HVA029	System effects calculation notes	1	Only for D.E.
HVA030	OUTDOOR air (ODA) ducting design	1	
HVA031	Battery room(s) EXHAUST air (EHA) flow rate(s) calculation notes	1	
HVA032	Buffer tank(s) calculations	1	
HVA033	Utilities requirements for HVAC	2	
HVA034	HVAC Automation philosophy	1	
HVA035	HVAC cause and effect diagrams	1	Only for D.E.
HVA036	Diffusers and grilles selection	1	Only for D.E.
HVA037	HVAC ducting supports - Detailed drawings	2	Only for D.E.
HVA038	HVAC shafts / risers sizing - (1 document per riser with detailed view for each level)	2	
HVA039	HVAC OUTDOOR air intakes location and layouts - (1 document per air intake with detailed view for each level)	2	
HVA040	Duct balancing calculation note (1 document per ductwork system)	1	Only for D.E.

	Document title	Acceptance Class	Remark
HVA041	HVAC piping balancing calculation note - (1 document per pipework system)	1	Only for D.E.
HVA042	HVAC piping stress calculation notes - (1 document per pipework system)	2	Only for D.E.
HVA043	Determination of insulation thickness for ducting	1	Only for D.E.
HVA044	Determination of insulation thickness for piping	1	Only for D.E.
HVA045	Calculation of piping for pressure safety valve discharge	1	Only for D.E.
HVA046	Determination of HVAC instruments ranges	2	Only for D.E.
HVA047	Expansion system(s) calculation notes - (1 document per piping system)	2	Only for D.E.
HVA048	HVAC duct insulation - Detailed drawings (including protection against corrosion, adhesives, cladding,...)	1	Only for D.E.
HVA049	Calculation of heat gains and heat losses on ducting (insulated and non insulated) - (1 document for each ducting system)	2	Only for D.E.
HVA050	Calculation of heat gains and heat losses on piping (insulated and non insulated) - (1 document for each ducting system)	2	Only for D.E.
HVA051	HVAC PLANT ROOM layout (including escape ways, maintenance areas, dismantling areas, access platforms,...) - (1 document for each plant room)	1	
HVA052	HVAC PLANT ROOM elevations	1	
HVA053	Typical for WALL penetrations (FIRE DAMPER installation)	1	
HVA054	Typical for piping design (construction, insulation, supporting, etc.)	1	Only for D.E.
HVA055	HVAC interfaces and battery limits (sea water, air instrument, power supply,...) – Detailed drawings	2	
HVA056	Sound pressure level in rooms – Calculation notes (1 document per ducting system)	1	Only for D.E.
HVA057	Sound attenuators calculation notes - (1 document per ducting system)	1	Only for D.E.
HVA058	Sound attenuators detailed drawings	1	Only for D.E.
HVA059	Anti-vibration supports calculation and selection (1 document per equipment)	1	Only for D.E.



	Document title	Acceptance Class	Remark
HVA060	Electrical architecture for <i>HVAC</i> equipment (single line diagram, including origins from electrical switchboards)	1	
HVA061	<i>HVAC</i> electrical cables calculation note	2	Only for D.E.
HVA062	<i>HVAC</i> electrical cables trays routing drawings - Layouts (1 document per level)	2	Only for D.E.
HVA063	<i>HVAC</i> electrical cables trays routing drawings - Elevations (1 document per level)	2	Only for D.E.
HVA064	Weight and center of gravity of <i>HVAC</i> equipment	2	Only weight during Basic Engineering
HVA065	Selection of <i>HVAC</i> three-ways valves	1	Only for D.E.
HVA066	Selection of <i>HVAC</i> balancing valves	1	Only for D.E.
HVA067	<i>HVAC</i> equipment technical specification (in addition to Company General Specifications, 1 document per <i>HVAC</i> item)	1	
HVA068	<i>HVAC</i> system Description Specification	1	
HVA069	<i>HVAC</i> Job Specification	1	
HVA070	Data sheets - <i>AHU</i> - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA071	Data sheets - Refrigerating equipment - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA072	Data sheets - Boiler - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA073	Data sheets -- <i>FAN UNIT</i> - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA074	Data sheets - Pump - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA075	Data sheets - <i>FIRE DAMPERS</i> - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA076	Data sheets - Three-ways valves - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA077	Data sheets - Balancing valves - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.

	Document title	Acceptance Class	Remark
HVA078	Data sheets – Shut-off valves - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA079	Data sheets – Pressure control valves - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA080	Data sheets – Pressure safety valves - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA081	Data sheets - Sound attenuators - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA082	Data sheets - <i>SHUT-OFF DAMPERS</i> - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA083	Data sheets - Anti-blast dampers - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA084	Data sheets - Heat exchangers - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA085	Data sheets – Balancing damper, shut-off damper, pressure relief damper - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA086	Data sheets – <i>FAN UNIT</i> - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA087	Data sheets – Coalescer filter, sand filter - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA088	Data sheets – Air intake - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA089	Data sheets – Buffer tank - (Document to be prepared by Engineering and filled in by <i>MANUFACTURER</i>)	1	Only for D.E.
HVA090	<i>HVAC</i> block diagram for automation purpose	1	
HVA091	Wiring diagrams for <i>HVAC CC</i> (control Control cabinet Cabinet) - (1 diagram per control cabinet)	2	Only for D.E.
HVA092	Wiring diagrams for <i>HVAC MCC</i> - (1 diagram per MCC)	2	Only for D.E.
HVA093	Layout and inner view drawing for <i>HVAC CC</i> (control Control cabinet Cabinet) - (1 document for each cabinet)	2	Only for D.E.

	Document title	Acceptance Class	Remark
HVA094	Electrical termination diagram for <i>HVAC CC</i> (control Control cabinet Cabinet) - (1 document for each cabinet)	2	Only for D.E.
HVA095	<i>HVAC</i> electrical power and control cable schedule	2	Only for D.E.
HVA096	<i>HVAC</i> control panel graphic design for operator	2	Only for D.E.
HVA097	<i>PLC</i> ladder diagram for <i>HVAC</i> automation	2	Only for D.E.
HVA098	<i>HVAC</i> Purchase Order Specification per type of main <i>HVAC</i> equipment / component - (1 document for each kind of component)	1	Only for D.E.
HVA099	<i>HVAC</i> Project Quality Plan	2	Only for D.E.
HVA100	<i>HVAC</i> Project HSE Plan	2	Only for D.E.
HVA101	<i>HVAC</i> Project Mobilisation Plan	2	Only for D.E.
HVA102	<i>HVAC</i> Project Procurement Plan	2	Only for D.E.
HVA103	Inspection and test plan for <i>AIR HANDLING UNIT(s)</i>	1	Only for D.E.
HVA104	Inspection and test plan for <i>FAN UNIT(s)</i>	1	Only for D.E.
HVA105	Inspection and test plan for <i>CHILLED WATER UNIT(s)</i>	1	Only for D.E.
HVA106	Inspection and test plan for boiler(s)	1	Only for D.E.
HVA107	Inspection and test plan for pump(s)	1	Only for D.E.
HVA108	Inspection and test plan for <i>FIRE DAMPER(s)</i>	1	Only for D.E.
HVA109	Inspection and test plan for <i>SHUT-OFF DAMPER(s)</i>	1	Only for D.E.
HVA110	Inspection and test plan for balancing damper(s)	1	Only for D.E.
HVA111	Inspection and test plan for three-ways valve(s)	1	Only for D.E.
HVA112	Inspection and test plan for buffer tank(s)	1	Only for D.E.
HVA113	Inspection and test plan for dosing tank(s)	1	Only for D.E.

	Document title	Acceptance Class	Remark
HVA114	Inspection and test plan for expansion tank(s)	1	Only for D.E.
HVA115	Inspection and test plan for manual damper(s)	1	Only for D.E.
HVA116	Inspection and test plan for anti-blast damper(s)	1	Only for D.E.
HVA117	Inspection and test plan for sand filter(s)	1	Only for D.E.
HVA118	Inspection and test plan for sound attenuator(s)	1	Only for D.E.
HVA119	Inspection and test plan for field instrument(s)	1	Only for D.E.
HVA120	Inspection and test plan for HVAC CC (control Control cabinetCabinet(s))	1	Only for D.E.
HVA121	Inspection and test plan for HVAC MCC cabinet(s)	1	Only for D.E.
HVA122	Inspection and test plan for automatic and manual valve(s)	1	Only for D.E.
HVA123	Inspection and test plan for heat exchanger(s)	1	Only for D.E.
HVA124	Inspection and test plan for safety valve(s)	1	Only for D.E.
HVA125	HVAC pressure ratings of pressurised equipment	2	Only for D.E.
HVA126	HVAC equipment lifting and transportation procedure	2	Only for D.E.
HVA127	HVAC equipment preservation procedure - (1 document for each kind of equipment)	2	Only for D.E.
HVA128	Installation procedure for HVAC equipment - (1 document for each equipment)	1	Only for D.E.
HVA129	Factory compliance test procedure for AIR HANDLING UNIT(s)	1	Only for D.E.
HVA130	FACTORY COMPLIANCE TESTS PROCEDURE FOR FAN UNIT(S)	1	Only for D.E.
HVA131	FACTORY COMPLIANCE TESTS PROCEDURE FOR FIRE DAMPER(S)	1	Only for D.E.
HVA132	FACTORY COMPLIANCE TESTS PROCEDURE FOR CHILLED WATER UNIT(S)	1	Only for D.E.
HVA133	FACTORY COMPLIANCE TESTS PROCEDURE FOR HVAC CC (CONTROL CONTROL CABINETCABINET(S))	1	Only for D.E.

	Document title	Acceptance Class	Remark
HVA134	<i>FACTORY COMPLIANCE TESTS</i> PROCEDURE FOR MCC CABINET(S)	1	Only for D.E.
HVA135	HVAC components removal procedure	1	Only for D.E.
HVA136	<i>FIRE DAMPER(s)</i> pneumatic diagram(s)	1	
HVA137	Input / Output list for HVAC System	2	Only for D.E.
HVA138	<i>MANUFACTURER</i> documentation for each HVAC component - (1 document for each component)	2	Only for D.E.
HVA139	General arrangement drawings for <i>AIR HANDLING UNIT(s)</i>	1	Only for D.E.
HVA140	General arrangement drawings for <i>FAN UNIT(s)</i>	1	Only for D.E.
HVA141	General arrangement drawings for <i>CHILLED WATER UNIT(s)</i>	1	Only for D.E.
HVA142	General arrangement drawings for boiler(s)	1	Only for D.E.
HVA143	General arrangement drawings for pump(s)	1	Only for D.E.
HVA144	General arrangement drawings for <i>FIRE DAMPER(s)</i>	1	Only for D.E.
HVA145	General arrangement drawings for <i>SHUT-OFF DAMPER(s)</i>	1	Only for D.E.
HVA146	General arrangement drawings for balancing damper(s)	1	Only for D.E.
HVA147	General arrangement drawings for anti-blast damper(s)	1	Only for D.E.
HVA148	General arrangement drawings for filter coalescer and weather louvre(s)	1	Only for D.E.
HVA149	General arrangement drawings for buffer tank(s) & dosing tank(s)	1	Only for D.E.
HVA150	General arrangement drawings for expansion tank(s)	1	Only for D.E.
HVA151	General arrangement drawings for three-ways valve(s)	1	Only for D.E.
HVA152	General arrangement drawings for heat exchanger(s)	1	Only for D.E.
HVA153	General arrangement drawings for safety valve(s)	1	Only for D.E.
HVA154	General arrangement drawings for automatic and manual valves	1	Only for D.E.



	Document title	Acceptance Class	Remark
HVA155	General arrangement drawings for duct heater(s)	1	Only for D.E.
HVA156	General arrangement drawings for sand filter(s)	1	Only for D.E.
HVA157	General arrangement drawings for constant volume boxe(s)	1	Only for D.E.
HVA158	General arrangement drawings for sound attenuator(s)	1	Only for D.E.
HVA159	Spare parts list	2	Only for D.E.
HVA160	Lubricant Schedule	2	Only for D.E.
HVA161	Trouble shooting diagrams	2	Only for D.E.
HVA162	Operation manual	2	Only for D.E.
HVA163	Maintenance manual	2	Only for D.E.
HVA164	<i>HVAC Pre-COMMISSIONING</i> procedures	2	Only for D.E.
HVA165	<i>HVAC Pre-COMMISSIONING</i> dossier	2	Only for D.E.
HVA166	<i>HVAC COMMISSIONING</i> procedures	2	Only for D.E.
HVA167	<i>HVAC COMMISSIONING</i> dossier	2	Only for D.E.
HVA168	<i>HVAC Pre-COMMISSIONING & COMMISSIONING</i> Interfaces	2	Only for D.E.
HVA169	<i>HVAC Pre-COMMISSIONING & COMMISSIONING</i> Consumables	2	Only for D.E.
HVA170	Site acceptance <i>HVAC</i> test procedures	2	Only for D.E.
HVA171	<i>HVAC</i> final documentation dossier	2	Only for D.E.
HVA172	<i>HVAC VENDOR(s)</i> document register	2	Only for D.E.
HVA173	Choice of <i>HVAC SUB-CONTRACTOR</i> (Technical Bid Analysis)	1	Only for D.E.
HVA174	<i>HVAC VENDOR(s)</i> list	1	Only for D.E.
HVA175	<i>FACTORY COMPLIANCE TESTS</i> REPORT FOR <i>AIR HANDLING UNIT(S)</i>	1	Only for D.E.

	Document title	Acceptance Class	Remark
HVA176	FACTORY COMPLIANCE TESTS REPORT FOR FAN UNIT(S)	1	Only for D.E.
HVA177	FACTORY COMPLIANCE TESTS REPORT FOR FIRE DAMPER(S)	1	Only for D.E.
HVA178	FACTORY COMPLIANCE TESTS REPORT FOR CHILLED WATER UNIT(S)	1	Only for D.E.
HVA179	FACTORY COMPLIANCE TESTS REPORT FOR HVAC CC (CCONTROL CCABINET(S))	1	Only for D.E.
HVA180	FACTORY COMPLIANCE TESTS REPORT FOR MCC CABINET(S)	1	Only for D.E.

3.3 Notes

1. Some documents listed hereafter have to be approved by Company before purchasing. The term "approved" means that the document is approved without comment by Company.
2. In case an approved document has to be updated (whatever the reason), *CONTRACTOR* has to produce this updated document. This updating is included within *HVAC CONTRACTOR* scope of work.
3. In case a document has to be updated, because of mistake, inconsistency, data updating, etc (and generally speaking, every time *CONTRACTOR* is cause of this updating), the document updating shall be produced without additional cost.
4. In case of a document updating has an impact on another document(s), these documents updating shall be produced by *CONTRACTOR* without additional cost.
5. Documents to be provided by *MANUFACTURERS* and / or *SUPPLIERS* are not listed in the above table.
6. The documents to be provided cannot be merged in one or several documents. The entity of each document shall be respected.
7. The information which is provided in a document (document n°1) cannot be included within another document (document n°2). In case it is necessary to refer to an information contented in the document n°1, into the document n°2, it shall be indicated "Refer to document n°1, section xxx" within the document n°2 ("section xxx" is the title of the section, without section numbering, where the information is indicated in the document n°1). The target of this requirement is to avoid that the same data is repeated in several documents; this could occur discrepancy in case of information updating.

3.4 Documents description

For some of the documents listed on previous section, a detailed description of document content is given in the following sections. The following specifications (type of document, software to be used, content, etc) are mandatory.



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For the documents listed in the following sections, parts of documents have to be provided during basic engineering or detailed engineering or during both phases.



3.4.1 HVAC Master Document Register

Document title: HVAC Master Document Register		
HVAC Document number: HVA001		
Document to be provided for:	☒ Basic Engineering ☒ Detailed Engineering	
Document included within Call For Tender Documents:	☒ Yes ☐ No	
Document type:	☐ Calculation note ☒ Text, Report ☐ Drawing, sketch, layout ☐ Documentation ☐ Software listing	
Format of native file:	☒ Word ☐ Access ☐ ☒ Excel ☐ Visio ☐ Autocad	
Native format to be provided for document approval: ☒ Yes ☐ No		
Document has to be Approved For Construction before purchasing:: ☒ Yes ☐ No		
☒ Document to be provided by HVAC CONTRACTOR	☐ Form produced by HVAC CONTRACTOR, filled-up by MANUFACTURER and HVAC CONTRACTOR	☐ Document to be provided by MANUFACTURER
Document purpose: to list the document to be provided by HVAC CONTRACTOR / sub-CONTRACTORS for design, construction, pre-COMMISSIONING, COMMISSIONING phases		
Main items:	Subject to be developed during:	
The HVAC Master Document Register shall be built as a table. The table shall include at least the following columns:	Basic	Detailed
Document title,	☒	☒
HVAC Document number (HVAXxx), as per the present specification,	☒	☒
HVAC Document number, as per project Documents numbering rules,	☒	☒
Format of native file,	☒	☒
Document Author,	☒	☒
Scheduled delivery date for each Engineering phase,	☒	☒
Document type	☒	☒
Document class	☒	☒
Revision number	☒	☒
Status	☒	☒



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Format	☒	☒
Document weight	☒	☒
Last return code	☒	☒
Remarks.	☒	☒
The documents provided by <i>MANUFACTURERS</i> have to be included within this list. The Master Documents Register shall be updated every month by <i>CONTRACTOR</i> .		



3.4.2 HVAC design philosophy

Document title: HVAC design philosophy		
HVAC Document number: HVA002		
Document to be provided for:		
☒ Basic Engineering ☒ Detailed Engineering		
Document included within Call For Tender Documents:		
☒ Yes ☐ No		
Document type:		
☐ Calculation note ☒ Text, Report ☐ Drawing, sketch, layout ☐ Documentation ☐ Software listing		
Format of native file:		
☒ Word ☐ Access ☐ ☐ Excel ☐ Visio ☐ Autocad		
Native format to be provided for document approval:		
☒ Yes ☐ No		
Document has to be Approved For Construction before purchasing:		
☒ Yes ☐ No		
☒ Document to be provided by HVAC CONTRACTOR ☐ Form produced by HVAC CONTRACTOR, filled-up by MANUFACTURER and HVAC CONTRACTOR ☐ Document to be provided by MANUFACTURER		
Document purpose: to present the HVAC system(s) proposed to maintain the ambient conditions within a building, taking into account the environment and operations parameters.		
Main items:		Subject to be developed during:
		Basic Detailed
Reference documents shall include: - o Standards - o Professional documents - o Regulations - o Codes - o Other documents - o General Specifications - o Projects documents. Important note: only Reference documents used for understanding of the present document have to be indicated.		☒ ☒
Project operating conditions: This section is an exhaustive list of operating conditions for which the HVAC equipment has to be designed. For each operating case, the HVAC function(s) provided by HVAC equipment shall clearly described.		☒ ☒



<i>HVAC</i> possible architectures: All imaginable solutions shall be proposed and compared, in terms of construction cost, maintenance cost, operating cost, availability, occupied space, weight, environment,, schedule,...	☒	☐
<i>HVAC</i> proposed architecture: The analysis of <i>HVAC</i> possible architectures shall lead to the proposed architecture. A comparative summary table, showing advantages and disadvantages shall be produced with the proposed <i>HVAC</i> architecture.	☒	☐
Detailed <i>HVAC</i> architecture: - o This section shall precisely detail the <i>HVAC</i> system(s), their interfaces with water system, electrical, instrument, communication systems and utilities. A dedicated section shall indicate the requirements in terms of voltage, industrial water, sea water, compressed air, ... - o The main lines for <i>HVAC</i> automation and manual operations shall be described in a dedicated section.	☐	☒



3.4.3 Lists of heat gains from equipment

Document title: List of heat gains from equipment		
HVAC Document number: HVA003		
Document to be provided for:		
☒ Basic Engineering ☒ Detailed Engineering		
Document included within Call For Tender Documents:		
☒ Yes ☐ No		
Document type:		
☐ Calculation note ☒ Text, Report ☐ Drawing, sketch, layout ☐ Documentation ☐ Software listing		
Format of native file:		
☒ Word ☐ Access ☐ ☒ Excel ☐ Visio ☐ Autocad		
Native format to be provided for document approval:		
☒ Yes ☐ No		
Document has to be Approved For Construction before purchasing:		
☒ Yes ☐ No		
☒ Document to be provided by HVAC CONTRACTOR ☐ Form produced by HVAC CONTRACTOR, filled-up by MANUFACTURER and HVAC CONTRACTOR ☐ Document to be provided by MANUFACTURER		
Document purpose: to list the heat dissipations from equipment managed by other disciplines than HVAC.		
Main items:		Subject to be developed during:
		Basic Detailed
Reference documents including: - o Standards - o Professional documents - o Regulations - o Codes - o Other documents - o General Specifications - o Projects documents. Important note: only References used for understanding of the present document have to be indicated.		☒ ☒
PROJECT LIFE CONTEXT: This section is an exhaustive list of situations meet by the construction during its life.		☒ ☒



Heat dissipation from equipment: <i>HVAC CONTRACTOR</i> shall prepare the heat dissipations lists form (Excel file) for other disciplines. For each room, the detailed list shall content the following columns: - o Room tag number - o Room designation - o Equipment or cabinet tag number - o Heat dissipation from equipment. Two columns shall be indicated (sensible and latent heat gains) for each <i>PROJECT LIFE CONTEXT</i> case (except pre-COMMISSIONING, COMMISSIONING and towing periods). The total heat dissipation, per equipment, per cabinet and grand total per room shall appear on the form. One border shall be transmitted to each discipline and shall be filled-up by the disciplines. The heat dissipation evaluation shall identify the sparing of equipment, temporary use, diversity factor, etc.	☒	☐
Heat dissipation from equipment: <i>HVAC CONTRACTOR</i> shall prepare the heat dissipations lists form for other disciplines. For each room, the detailed list shall content the following columns: - o Room tag number - o Room designation - o Equipment or cabinet tag number - o Heat dissipation from equipment. Two columns shall be indicated (sensible and latent heat gains) for each <i>PROJECT LIFE CONTEXT</i> case. The total heat dissipation, per equipment, per cabinet and grand total per room shall appear on the form. One border shall be transmitted to each discipline and shall be filled-up by the disciplines. The heat dissipation evaluation shall identify the sparing of equipment, temporary use, diversity factor, etc.	☐	☒



3.4.4 HVAC basis of design

Document title: HVAC basis of design		
HVAC Document number: HVA004		
Document to be provided for:		
☒ Basic Engineering ☒ Detailed Engineering		
Document included within Call For Tender Documents:		
☒ Yes ☐ No		
Document type:		
☐ Calculation note ☒ Text, Report ☐ Drawing, sketch, layout ☐ Documentation ☐ Software listing		
Format of native file:		
☒ Word ☐ Access ☐ ☐ Excel ☐ Visio ☐ Autocad		
Native format to be provided for document approval:		
☒ Yes ☐ No		
Document has to be Approved For Construction before purchasing:		
☒ Yes ☐ No		
☒ Document to be provided by HVAC CONTRACTOR ☐ Form produced by HVAC CONTRACTOR, filled-up by MANUFACTURER and HVAC CONTRACTOR ☐ Document to be provided by MANUFACTURER		
Document purpose: to summarize the data necessary to realize the HVAC components calculation, design and selection. Only common data to all HVAC studies and general data shall be indicated.		
Main items:		Subject to be developed during:
		Basic Detailed
Reference documents including: - o Standards - o Professional documents - o Regulations - o Codes - o Other documents - o General Specifications - o Projects documents. Important note: only Reference documents used for understanding of this HVAC basis of design or used as a basis of design have to be indicated.		☒ ☒
PROJECT LIFE CONTEXT: This section is an exhaustive list of situations meet by the construction during its life.		☒ ☒



Location of project (latitude, longitude, altitude)	☒	☒
Minimum outside temperature and concomitant relative humidity, on operation site	☒	☐
Minimum outside temperatures and concomitant relative humidities, during construction, pre-COMMISSIONING, COMMISSIONING, towing, on operation site	☐	☒
Maximum outside temperatures and concomitant relative humidities, on operation site	☒	☐
Maximum outside temperatures and concomitant relative humidities, during construction, pre-COMMISSIONING, COMMISSIONING, towing, on operation site	☐	☒
Atmosphere clearness factor, ground / sea reflectance factors, daily range, wind, dust on operation site	☒	☒
Air temperature and concomitant relative humidity for <i>OUTDOOR AIR</i> used at exchangers, on <i>AHUs</i> , on operation site	☒	☒
Air temperature and concomitant relative humidity for <i>OUTDOOR AIR</i> used at exchangers, on <i>AHUs</i> , during construction, pre-COMMISSIONING, COMMISSIONING, towing, on operation site	☐	☒
Available pressure, location of tie-in, temperature and quality of each fluid that <i>HVAC</i> systems can use	☒	☒
Maximum allowed pressure loss, temperature gradient between inlets and outlets tie-in, for of each fluid which can be used by <i>HVAC</i> systems)	☒	☒
<i>HVAC</i> systems main description (function, availability, main areas served)	☒	☒
Classification of rooms regarding <i>HVAC</i> systems. A table shall be provided indicating the <i>HVAC</i> system serving the room.	☒	☒
Table indicating ambient conditions to be maintain for each room (Minimum and maximum dry bulb and concomitant relative humidity, tolerances)	☒	☒
Table indicating <i>OUTDOOR AIR</i> volume required for each room, for each <i>HVAC</i> system,	☒	☒
Table indicating <i>AIR CHANGE</i> volume required for each room, for each <i>HVAC</i> system	☒	☒
Table indicating <i>EXTRACT AIR</i> volume required from each room, for each <i>HVAC</i> system	☒	☒
Table indicating sound pressure levels acceptable for each room, for each <i>HVAC</i> system	☒	☒
Room pressurisation (Outdoor reference), for each room, for each <i>HVAC</i> system	☒	☒
Leakage air flow rates through <i>WALLs</i> and doors, according to differential pressures (maximum real values and data to be considered for calculations),	☒	☒



Table indicating heat dissipation from lighting for each room, per <i>HVAC</i> system	☒	☒
Table indicating occupation and activity for each room, per <i>HVAC</i> system. Heat dissipation (sensible and latent) shall be indicated for different temperatures	☒	☒
Table indicating heat gains from equipment for each room, for each <i>HVAC</i> system	☒	☒
Table indicating, for each <i>HVAC</i> system, the status of the system for each case of <i>PROJECT LIFE CONTEXT</i>	☒	☒
<i>HVAC</i> over-design values to be considered in <i>HVAC</i> calculation notes	☒	☒
Maximum air velocity(ies) in <i>OCCUPIED AREA</i>	☒	☒
Refrigerant gas allowed for refrigerating equipment	☒	☒
List of rooms classification, <i>HVAC</i> system by <i>HVAC</i> system (<i>NORMAL HVAC SYSTEM</i> , <i>ESSENTIAL HVAC SYSTEM</i> , ...)	☒	☒
Principle of performance acceptance.	☒	☒



3.4.5 U-value calculations

Document title: U-value calculations		
HVAC Document number: HVA005		
Document to be provided for:		
☐ Basic Engineering ☒ Detailed Engineering		
Document included within Call For Tender Documents:		
☐ Yes ☐ No		
Document type:		
☒ Calculation note ☐ Text, Report ☒ Drawing, sketch, layout ☐ Documentation ☐ Software listing		
Format of native file:		
☒ Word ☐ Access ☐ ☒ Excel ☐ Visio ☐ Autocad		
Native format to be provided for document approval:		
☒ Yes ☐ No		
Document has to be Approved For Construction before purchasing:		
☒ Yes ☐ No		
☒ Document to be provided by HVAC CONTRACTOR ☐ Form produced by HVAC CONTRACTOR, filled-up by MANUFACTURER and HVAC CONTRACTOR ☐ Document to be provided by MANUFACTURER		
Document purpose: to calculate the U-value to be used for heat gains and heat losses calculations.		
Main items:	Subject to be developed during:	
	Basic	Detailed
Composition of WALLS A schema shall be provided for each WALL, indicating the position of the different layers, the rooms tag numbers separated by the WALL (or outside position when external WALL) For each WALL, the following characteristics shall be indicated: - o Material - o Thickness - o Density - o Thermal conductivity - o Water permeability.	☐	☒
Algorithms used for external convection and external radiation factors. This algorithm shall take into account the characteristics of surface (material, colour), the ambient parameters (wind velocity), the direction of thermal flux.	☒	☒

Algorithms used for internal convection and internal radiation factors.The algorithm shall take into account the characteristics of surface (material, colour), the direction of thermal flux,	☒	☒																
Algorithm used for U-value calculations	☒	☒																
U-value calculations. This calculation note shall be realized with Excel software. A synthesis table shall indicate all data used for U- value calculations. The intermediate calculations results shall be indicated for each U-value calculated: - o External convection and radiation factor - o Internal convection and radiation factor - o WALL resistance - o U-value.	☐	☒																
<u>General comments regarding the method to be applied:</u> Each WALL has to be tagged. The tagging method is the following: <i>Face 1 – Face 2</i> Where <i>Face 1</i> is the room number for which the WALL U value has to be calculated <i>Face 2</i> is the room number for which the WALL U value has to be calculated The two rooms are separated by the studied WALL. In case of outdoor WALL, Face 1 shall be indicated “Outdoor Exposure”, where “Outdoor exposure” corresponds to the WALL exposure. Tagging to be used for "Outdoor exposure": <table><tr><td>North:</td><td>N</td></tr><tr><td>North-East:</td><td>NE</td></tr><tr><td>East:</td><td>E</td></tr><tr><td>South-East:</td><td>SE</td></tr><tr><td>South:</td><td>S</td></tr><tr><td>South-West:</td><td>SW</td></tr><tr><td>West:</td><td>W</td></tr><tr><td>North-West</td><td>NW</td></tr></table>			North:	N	North-East:	NE	East:	E	South-East:	SE	South:	S	South-West:	SW	West:	W	North-West	NW
North:	N																	
North-East:	NE																	
East:	E																	
South-East:	SE																	
South:	S																	
South-West:	SW																	
West:	W																	
North-West	NW																	