Design and Development

1.0 Purpose

The purpose of this procedure is to design the product to meet customer requirements.

1.1 Application

This procedure is applicable to all the projects entrusted to KSPHC by the client organization.

2.0 Responsibility

Responsibility and Authority lies with the Superintending Engineer(designs) or Superintending Engineer, Head office.

3.0 Terms and definitions

1) **Activity** – smallest identified item of work in a project process.
2) **Audit –** Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.
3) **Capability** – ability of an organization, system or process to realise a product that will fulfill the requirements for that product.
4) **Characteristic –** Distinguishing feature
5) **Concession –** Permission to use or release a product that does not conform to specified requirement.
6) **Contractor -** Organization or person that provides a product (A producer, distributor, retailer or vendor of a product, or a provider of a service or information; in contractual situation, a contractor is also called as “contractor”; in the context of projects, ‘contractor’ or ‘subcontractor’ is often used in place of “supplier” or vice versa .
7) **Customer / Client / user Department –** Organization or person that receives a product / service. In this case the HOD of the concerned Department is considered as the competent person for according approval.
8) **Design and Development –** Set of processes that transform requirements into specified characteristics or into the specifications of a product, process or system.
9) **Deviation Permit –** Permission to depart from the originally specified requirements of a product prior to realization.
10) **Document –** Information and its supporting medium.

11) **Process –** Set of inter-related or interacting activities, which transforms inputs into outputs.

    Note 1: Inputs to a process are generally outputs of other processes.

    Note 2: Processes in an organization are generally planned and carried out under controlled conditions to add value.

    Note 3: A process where the conformity of the resulting product cannot be readily or economically verified is frequently referred to as a special process.

12) **Procedure –** Specified way to carry out an activity or a process.
13) **Product –** Result of a process
14) **Progress evaluation –** assessment of progress made on achievement of the project objectives
15) **Project –** Building or structure entrusted to by client.
16) **Project management –** planning, organizing, monitoring, controlling and reporting of all aspects of a project and the motivation of all those involved in it to achieve the project objectives.
17) **Project management plan –** document specifying what is necessary to meet the objective(s) of the project.
18) **Quality Assurance –** Part of quality management focused on providing confidence that quality requirements will be fulfilled.
19) **Quality Characteristic –** Inherent characteristic of a product, process or system related to a requirement.
20) **Quality Control –** Part of quality management focused on fulfilling quality requirements.
21) **Quality Management** – Coordinated activities to direct and control an organization with regard to quality.

    Note: Directions and control with regard to quality generally includes establishments of quality policy and quality objectives, quality planning, quality control, quality assurance and quality improvement.

22) **Quality Plan –** Document specifying which procedures and associated resources shall be applied by whom and when to a specific projects, product, process or contract.

23) **Quality Planning –** Part of Quality management focused on setting quality objectives and specifying necessary operational processes and related resources to fulfill the quality objectives.

    Note: Establishing quality plans can be part of quality planning.

24) **Record** – Anything (Such as a document or a photograph) providing permanent evidence of or information about past events; it also includes documents in digital form

25) **Requirement –** need or expectation that is stated, generally implied or obligatory.

26) **Review –** Activity undertaken to determine the suitability, adequacy and effectiveness of the subject matter to achieve established objectives.

27) **Specification –** Document and stated requirements of the product.

28) **Supplier –** Organization or person that provides a product (A producer, distributor, retailer or vendor of a product, or a provider of a service or information; in contractual situation, a supplier is sometimes called a "contractor"; in the context of projects, 'contractor' or 'subcontractor' is often used in place of "supplier").
    Note: A supplier can be internal or external to the organization.

29) **Verification –** Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

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4.0 Procedures

Customer / User Departments needs and expectations for products and processes, both stated and generally implied are transferred into documented requirements, including statutory and regulatory aspects after being reviewed by the customer/ User Departments and mutually agreed to by KSPH&IDCL and the customer / User Departments. Based on this, conceptual drawings are prepared and sent to the customer/ User Departments wherever required. This procedure provides details of activities in a sequential form. It is implied that whenever, in a process step the resulting output is not conforming to the requirements, preceding process (es) have to be repeated to correct the situation. Product design and development will not proceed until the planned arrangements have been satisfactorily completed.

Wherever system procedures are established that provide detailed information about that process, relevant procedures have been referenced. In order to facilitate easy understanding of process sequence, design and development processes are divided into convenient phases / stages.

4.1 Numbering system for drawings

Whether generated internally or by the contractors, following numbering system for drawings shall be followed.

AA / BB / CC / DD / EE / FF / GG where

AA = Project code
BB = Client ID
CC = Scheme
DD = Type of Building
EE = Type of drawing (Architectural or Structural)
FF = Serial number of the drawing
GG = Year of issue

Drawings shall indicate the revision status apart from the above.

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Whenever drawings are issued, it shall indicate (using a rubber stamp) the intended purpose of issue such as:

T = For Tender purpose

R = Released for construction

4.2 Design and development procedure

Sl. No.	Activity	Description	Responsibility	Reference documents
1.	Initiation of the project	The project is initiated after receipt of communication from Customer / User Departments	MD	Customer / User Departments communication
2.	Feasibility	Feasibility of the project with respect to site conditions are analysed	EE(Cons)/ SE	Feasibility report from the EE(Consn)
3.	Conceptual drawings	a. Customer / User Departments needs and requirements are laid out in the form of preliminary drawings b. Where type designs are required to be adopted previous type designs will be referred to c. In case of buildings where consultancy is required the services of empanelled Architects may be utilised for preparation of conceptual drawings	Dy. Architect / Executive Engineer EE(Cons)/ SE Dy. Architect/ Executive Engineer	Customer / User Departments Communication / feasibility report
4	Approval to conceptual drawings	The conceptual drawings are to be got approved by the Customer / User Departments.	EE(Cons)/ SE	Conceptual drawings
5	Calendar for preparation/ issue of detailed drawing	After award of work.	SEcontracts/ SE	Work order, contract documents
6	Preparation of detailed designs and drawings.	A) 1) Receipt of site conditions & SBC 2) Review of design parameter 3) Firming up of layout and orientation of building 4) Architectural designs and detailing 5) Structural designs and drawings as per standard codes / practices	SE SE	i. Approved drawings ii. Feasibility report iii. Format for approval of layout F:10-1

Sl. No.	Activity	Description	Responsibility	Reference documents
		and in accordance with tender specifications. 6) Release of Construction drawings in stages. B) Where the services of empanelled Architects are utilised for such works the detailed construction drawings may be obtained from them. In such cases, all the structural designs and drawings shall be approved		iv.SBC report v. BIS codes vi. Format for issue of construction drawings – F:10-2 vii. Schedule of issue of construction drawings – F:10-3
7	Deviation	Modification for construction constraints. Depending on the necessity and resources available they may have to be considered.	SE contracts	Communication from user department, inspection reports of inspecting Officers and / or reports from EE(Construction)
8	Issue of revised / modified drawings	Based on approved deviations the detailed revised / modified construction drawings are to be issued.	SE	Approval for deviations
9	Implementation of EMS concepts while designing	EMS concepts such as energy saving and eco-friendly measures shall be considered while designing the new projects.	Dy. Architect/EE (Construction)/SE	EMS-OCP-01 & EMS-OCP-02

All drawings shall be uploaded to the concerned projects in the drawing folder by concerned EE's

6.0 Reference

a) ISO 9001: 2008 Clause Number 7.3

b) ISO 14001:2004 Clause Number 4.4.6

c) IMS Manual Clause Number 7.3

7.0 Associated Documents

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a) Procedure for control of documents
b) Procedure for control of records IMSP 02
c) Procedure for project management IMSP 09
d) Procedure for purchase (Construction) IMSP 11
e) Procedure for control of monitoring and measuring devices IMSP 13
f) Procedure for control of non conforming products IMSP 15
g) Procedure for corrective & preventive action IMSP 27
h) EMS-OCP-01 Eco-friendly measures
i) EMS-OCP-02 Energy saving and other alternatives

Approved by : Managing Director