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Foreword

The material contained in the Nuclear Medicine Design Guide is the culmination of a partnering effort by the Department of Veterans Affairs Veterans Health Administration and the Facilities Quality Office. The goal of the Design Guide is to ensure the quality of VA facilities while controlling construction and operating costs.

This document is intended to be used as a guide and as a supplement to current technical manuals and other VA criteria in the planning of Nuclear Medicine. **The Design Guide is not to be used as a standard design, and the use of this Design Guide does not limit the project Architect's and Engineer's responsibilities to develop a complete and accurate project design that best meets the user's needs and the applicable code requirements.**

Lloyd H. Siegel, FAIA
Director, Strategic Management Office
Office of Construction & Facilities Management
Washington, DC

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Facilities Management Office

Lloyd H. Siegel, FAIA
ACFMO for Strategic Management
Washington, DC

Kurt Knight
Director Facilities Quality Service
VHACO (181A)
Washington, DC

Donald L. Myers, AIA, NCARB
Senior Architect Facilities Quality Service
VHACO (181A)
Washington, DC

Nuclear Medicine Advisory Group

Dr. Milton Gross
Chief Nuclear Medicine
Ann Arbor VAMC
2215 Fuller Rd
Ann Arbor, MI 48105

Prime Consultant

Cannon Design

Jose M. Silva, AIA, Project Principal

Ronald Villasante, Assoc. AIA, CAP

Scott Speser, NCARB, LEED

Millard Berry III, PE, LEED

Ronald Curtis, PE

Michael Dlugosz, PE

J. Joe Scott, CPD

Elizabeth Randolph

Blake Bowen

Radiology / Imaging Specialty Sub-consultants

Junk Architects / MRI-Planning

Tobias Gilk, M Arch

Robert Junk, AIA, AHRA

Introduction

The Nuclear Medicine Design Guide was developed as a tool to assist Contracting Officers, Medical Center Staff, and Architects and Planners with the design and construction of Nuclear Medicine facilities. It is not intended to be project specific; but rather provide an overview with respect to the design and construction of Nuclear Medicine facilities.

Guide plates for various rooms within Nuclear Medicine are included in this chapter to illustrate typical VA furniture, equipment, and personnel space needs. They are not project specific as it is not possible to foresee future requirements. The project specific space program is the basis of design for an individual project. It is important to note that the guide plates are intended as a generic graphic representation only.

Equipment manufacturers should be consulted for actual dimensions, utilities, shielding, and other requirements as they relate to specified equipment. Use of this design guide does not supersede the project architects' and engineers' responsibilities to develop a complete and accurate design that meets the user's needs and complies with appropriate code requirements.

Definitions

Diagnostic Room: Designated room containing diagnostic equipment performing patient procedures such as Nuclear Medicine, Bone Densitometry, PET/CT. It may also be referred to as Scanning Room, Procedure Room, or Gantry Room.

“Hot”: A colloquial term used to describe the presence of measurable radioactivity. In addition to the nature of the radioactive material itself, the distance from the radioisotope and the time of exposure are important safety considerations. To keep exposure “as low as reasonably achievable” (ALARA), special waiting / holding areas, toilets and other support spaces may be designed for patients who have received a radioactive substance, depending upon factors including the specific radiopharmaceutical used.

“Hot Lab” / Radiopharmacy: Area for storage, preparation and dispensing of radiopharmaceuticals. It must be secured and provided with adequate shielding. The amount of shielding is determined by a health physicist or radiation safety officer (RSO), depending upon the anticipated usage of specific radioisotopes.

Nuclear Imaging: Method of producing images using gamma or scintillation cameras that detect radiation from different parts of a patient’s body after administration of a radioactive tracer material. Since physiologic / pathophysiologic processes are being monitored / measured, the patient must remain under the gamma camera for periods of time that vary from 20 to 90 minutes and may return for delayed images later in the same day or several days later. Modalities include Planar and Single Photon Emission Computed Tomography (SPECT) imaging, Positron Emission Tomography (PET), Fusion Imaging and Coincidence Detection imaging.

Patient Dose Administration: The process of metabolizing delivered radiopharmaceutical agents in order to image the targeted metabolic function. Patient Dose Administration may require minutes, or even hours, before the imaging process can accurately capture the desired results. Patient Dose Administration periods will be dependent upon the radiopharmaceutical utilized and the metabolic rate of the tissues / organs targeted.

Picture Archiving and Communication System (PACS): The digital capture, transfer and storage of diagnostic images. A PACS system consists of workstations for interpretation, image/data producing modalities, a web server for distribution, printers for file records, image servers for information transfer and holding, and an archive of off-line information. A computer network is needed to support each of these devices.

Positron Emission Tomography (PET): Positron Emission Tomography, also called PET imaging or a PET scan, is a diagnostic examination that involves the acquisition of physiologic images based on the annihilation radiation of positron-emitting radioisotopes administered to patients. Positrons are tiny particles emitted from a radioactive substance administered to the patient. The subsequent images of the human body developed with this technique are used to evaluate a variety of diseases.

PET/CT (Combined) Imaging: In one examination, a PET/CT scanner combines two state of the art imaging modalities and merges PET and CT images together. By monitoring the body’s metabolism, PET provides information of cell activity whether a growth within the body is cancerous or not. CT simultaneously provides detailed anatomic information about the location, size, and shape of various lesions and tissue.



Radiobioassay: This process utilizes specimens such as blood, urine, feces, spinal fluid, biopsies, etc., that are received and /or collected from patients, evaluated, and measured. Radioactive materials are incorporated in vivo or in vitro and determinations of body functions made. Specimen receiving, holding, preparation, examination, interpretation, consultation, record distribution, storage and retrieval occur in areas separate from the clinical imaging function.

Radiopharmaceutical: Radiopharmaceutical: Term to describe radioactive agents administered to a patient. Different agents have an affinity for the varying physiologic processes of the body. These radioactive substances employed for diagnostic testing / imaging typically have very low doses of radioactivity, enabling patients to be treated on an outpatient basis with minimal restrictions following the exam.

Scintillation or Gamma Camera: Nuclear imaging camera consisting of a collection crystal (head) and magnifiers that create images of a target physiologic process from the radiation being emitted from a patient following the administration of a radioactive uptake material.

Single Photon Emission Computed Tomography (SPECT): Diagnostic imaging modality that usually employs a rotating collection crystal (head) and magnifiers to create three dimensional images of the distribution of single photon emissions from the body. The images of the varying dimensional relationships are computer generated resulting in improved resolution of target organs / processes.

Abbreviations

A	Amps
AC	Air Conditioning
ABA	Architectural Barriers Act
AC/HR	Air Changes per Hour
ADA	Americans with Disability Act
ADAAG	ADA Accessibility Guidelines
A/E	Architectural / Engineering Firm
AHJ	Authority Having Jurisdiction
AIA	American Institute of Architects
ANSI	American National Standards Institute
AR	As Required
ASRAE	American Society of Heating Refrigerating & Air-Conditioning Engineers
BGSF	Building Gross Square Feet
BTU	British Thermal Unit
CARES	Capital Asset Realignment for Enhanced Services
CFM	Cubic Feet per Minute
DOE	Department of Energy
DGSF	Departmental Gross Square Feet
DVA	Department of Veterans Affairs
FAR	Floor Area Ratio
FC	Foot Candle
OCFM	Office of Construction & Facilities Management
GSF	Gross Square Feet
GSM	Gross Square Meters
HIPAA	Healthcare Insurance Portability and Accountability Act
HP	Horsepower
HVAC	Heating, Ventilating and Air Conditioning
IAQ	Indoor Air Quality
IBC	International Building Code
JCAHO	Joint Commission (on Accreditation of Healthcare Organizations)
LB	Pound, Pounds
LUX	Lumen Per Square Meter
NEC	National Electrical Code
NFPA	National Fire Protection Association
NHCU	Nursing Home Care Unit

NSF	Net Square Feet
NSM	Net Square Meters
NTS	Not to Scale
NUSIG	National Uniform Seismic Installation Guidelines
OSHA	Occupational Safety and Health Administration
RCP	Reflected Ceiling Plan
RH	Relative Humidity
SF	Square Feet, Square Foot
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SqM	Square Meters
TIL	Technical Information Library
TV	Television
UBC	Uniform Building Code
UFAS	Uniform Federal Accessibility Standards
V	Volts
VA	Department of Veterans Affairs
VACO	Veterans Affairs Central Office
VAFM	Veterans Affairs Facilities Management
VAMC	Veterans Affairs Medical Center
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network































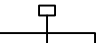




LOGISTICAL CATEGORIES (LOG CATS)




















VV: Department of Veterans Affairs furnished and installed - Medical Care Appropriations

VC: Department of Veterans Affairs furnished and Contractor installed - Medical Care Appropriations for Equipment and Construction Appropriations for Installation

CC: Contractor Furnished and Installed - Construction Appropriations

CF: Construction Appropriations - Department of Veterans Affairs furnished - Installed by the Department of Veterans Affairs or Contractor

	DUPLEX RECEPTACLE, NEMA 5-20R - 20AMP- MOUNTED 450MM (18")AFF UNLESS OTHERWISE NOTED.		WALL MOUNTED TELEPHONE OUTLET-MOUNTED 1200MM (48") AFF UNLESS OTHERWISE NOTED
	DUPLEX RECEPTACLE, NEMA 5-20R - 20AMP- MOUNTED ABOVE COUNTER TOP		COMPUTER TERMINAL OUTLET - VERIFY EXACT NEEDS-PROVIDE SIGNAL AND POWER OUTLET AS REQUIRED
	DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER, NEMA 5-20R - 20 AMP - MOUNTED 450MM (18")AFF UNLESS OTHERWISE NOTED		SPEAKER-CEILING MOUNTED
	DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER, NEMA 5-20R - 20 AMP - MOUNTED ABOVE COUNTER TOP		INTERCOM OUTLET
	WEATHERPROOF DUPLEX RECEPTACLE WITH GFI, NEMA 5-20R - 20 AMP - MOUNTED ABOVE 450MM (18") AFF UNLESS OTHERWISE NOTED		NURSE CALL DOME LIGHT-CEILING MOUNTED
	QUADRAPLEX OUTLET, NEMA 5-20R - 20 AMP - MOUNTED ABOVE 450MM (18") AFF OR QUADRAPLEX OUTLET, NEMA 5-20R - 20 AMP - PEDESTAL-MOUNTED.		NURSE CALL DOME LIGHT-WALL MOUNTED
	QUADRAPLEX OUTLET, NEMA 5-20R - 20 AMP - MOUNTED ABOVE COUNTER TOP		NURSE CALL DUTY STATION
	QUADRAPLEX OUTLET WITH GROUND FAULT INTERRUPTER, NEMA 5-20R - 20AMP - MOUNTED 450MM (18") AFF UNLESS OTHERWISE NOTED		EMERGENCY NURSE CALL
	QUADRAPLEX OUTLET WITH GROUND FAULT INTERRUPTER, NEMA 5-20R - 20AMP - MOUNTED ABOVE COUNTER TOP		NURSE CALL STAFF STATION
	DUPLEX RECEPTACLE, NEMA 5-20R - 20AMP - EMERGENCY POWER-MOUNTED 450MM (18")AFF UNLESS OTHERWISE NOTED		VOLUME CONTROL-WALL MOUNTED
	QUADRAPLEX RECEPTACLE, NEMA 5-20R - 20AMP - EMERGENCY POWER		JUNCTION BOX-PURPOSE AND LOCATION AS NOTED
	SPECIAL RECEPTACLE		SUPPLY AIR DIFFUSER
	TELEVISION OUTLET		EXHAUST OR RETURN AIR REGISTER OR GRILLE
	TELEPHONE OUTLET-MOUNTED 450MM (18") AFF UNLESS OTHERWISE NOTED		EMERGENCY EXHAUST GRILLE
			THERMOSTAT
			HUMIDISTAT
			COMBINATION FAUCET HOSE BIBB
			VACUUM
			MEDICAL AIR
			OXYGEN
			ELECTRICAL STRIP MOLD - NEMA 5-20R RECEPTACLES AT 600MM (2'-0") INTERVALS

	SINGLE POLE SWITCH		WALL-MOUNTED FLUORESCENT FIXTURE
	SINGLE POLE SWITCH – SUFFIX OF a,b OR c INDICATES SEPARATE CONTROL OR FIXTURES WITH SAME DESIGNATION		2'x2' FLUORESCENT FIXTURE-EMERGENCY POWER
	DIMMER SWITCH		2'x4' FLUORESCENT FIXTURE-EMERGENCY POWER
	THREE WAY SWITCH		WALL MOUNTED FLUORESCENT FIXTURE-EMERGENCY POWER
	DOOR SWITCH		WALL MOUNTED LIGHT FIXTURE-TYPE AS NOTED
	FUSED OR UNFUSED DISCONNECT SWITCH		LIGHT FIXTURE-TYPE AS NOTED
	EMERGENCY POWER OFF (EPO) PUSH BUTTON		LIGHT FIXTURE-TYPE AS NOTED EMERGENCY POWER
	2'x2' FLUORESCENT FIXTURE		CIRCUIT BREAKER
	1'x4' FLUORESCENT FIXTURE		BATTERY POWERED CLOCK
	2'x4' FLUORESCENT FIXTURE		