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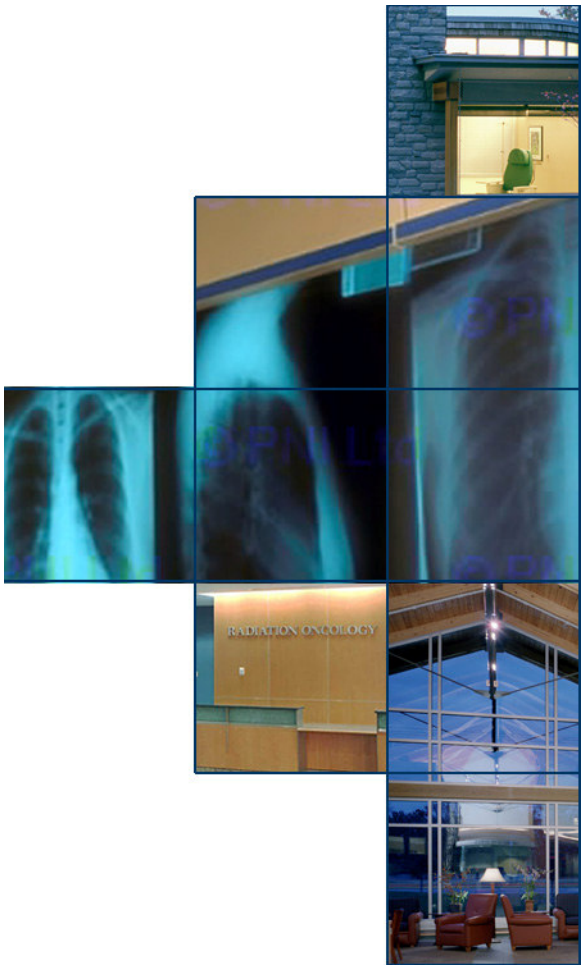

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Foreword

The material contained in the Radiation Therapy 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 Radiation Therapy Service. Radiation Therapy Service is referred to as Radiation Therapy throughout this document. **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.**

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Introduction

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

Guide plates for various rooms within Radiation Therapy 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

CT Simulation: A CT procedure in which the specific pathology is localized within the patient, who is placed in a precise and reproducible position, for use in treatment planning for radiation therapies. CT Simulation utilizes conventional a CT Scanner outfitted with specific simulation hardware and software.

External Radiation Therapy: The use of high-energy penetrating wave or particle beams used to damage or destroy cancerous cells. External Radiation Therapy may also be used as a form of treatment for some non-cancerous diseases, and is frequently delivered on a recurring outpatient basis. High-energy beams do not leave the patient 'radioactive' and there are no concerns about exposure of the patient to other persons post-treatment. See Linear Accelerator.

Intensity Modulated Radiation Therapy (IMRT): IMRT is an advanced external beam radiation therapy which utilizes computer images to match radiation to the size and shape of a tumor. Through the use of multiple smaller beams from different angles and of varying intensities, IMRT varies the shape of the radiation delivered to the treatment area, minimizing damage to surrounding healthy tissue. See Stereotactic Radiosurgery.

Internal Radiation Therapy: The use of low-level radioactive implants or 'seeds' to deliver radiation to local tissue structures. Frequently implanted in tumors, the radioactive decay damages or destroys the immediately surrounding tissue. Implants are specifically chosen to match the prescribed radiation dose necessary to damage the tumor while protecting the surrounding healthy tissues. Radioactive implants are placed surgically. Depending upon the implant's intensity, patients may be 'radioactive' for a period of time post-implantation and may need to remain in hospital, segregated from others until the radioactive decay reduces the strength of the implant.

Linear Accelerator (Linac): Device which produces and delivers high-energy beams which, in the hospital setting, is used to damage or destroy targeted tissues or structures, frequently cancerous tumors, within the patient's body. See Stereotactic Radiosurgery.

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.

Stereotactic Radiosurgery: The process by which lower-intensity radiation beams are projected to the tumor or target area from multiple points of origin. This allows relatively high radiation doses to the target area while exposing the surrounding tissues to significantly lower levels of radiation energy. Stereotactic Radiosurgery equipment is available in both frame-based systems for treatment of head and neck, and frameless systems which can treat any anatomic area.

Treatment Planning: Following precise identification of the position, size and shape of a tumor or target area, typically through MR or CT based simulation, the optimal means of radiation therapy is planned in which the precise radiation doses are delivered to target areas while minimizing the radiation exposure to adjacent and surrounding tissues. This plan is typically mapped out three dimensionally and computer plotted to guide radiation therapy / radiosurgery.

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.


DUPLEX RECEPTACLE, NEMA 5–20R – 20AMP– MOUNTED ABOVE COUNTER TOP


DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER, NEMA 5–20R – 20 AMP – MOUNTED 450MM (18")AFF UNLESS OTHERWISE NOTED


DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER, NEMA 5–20R – 20 AMP – MOUNTED ABOVE COUNTER TOP


WEATHERPROOF DUPLEX RECEPTACLE WITH GFI, NEMA 5–20R – 20 AMP – MOUNTED ABOVE 450MM (18") AFF UNLESS OTHERWISE NOTED


QUADRAPLEX OUTLET, NEMA 5–20R – 20 AMP – MOUNTED ABOVE 450MM (18") AFF OR QUADRAPLEX OUTLET, NEMA 5–20R – 20 AMP – PEDESTAL–MOUNTED.


QUADRAPLEX OUTLET, NEMA 5–20R – 20 AMP – MOUNTED ABOVE COUNTER TOP


QUADRAPLEX OUTLET WITH GROUND FAULT INTERRUPTER, NEMA 5–20R – 20AMP – MOUNTED 450MM (18") AFF UNLESS OTHERWISE NOTED


QUADRAPLEX OUTLET WITH GROUND FAULT INTERRUPTER, NEMA 5–20R – 20AMP – MOUNTED ABOVE COUNTER TOP


DUPLEX RECEPTACLE, NEMA 5–20R – 20AMP – EMERGENCY POWER–MOUNTED 450MM (18")AFF UNLESS OTHERWISE NOTED


QUADRAPLEX RECEPTACLE, NEMA 5–20R – 20AMP – EMERGENCY POWER


SPECIAL RECEPTACLE

TELEVISION OUTLET


TELEPHONE OUTLET–MOUNTED 450MM (18") AFF UNLESS OTHERWISE NOTED


WALL MOUNTED TELEPHONE OUTLET–MOUNTED 1200MM (48") AFF UNLESS OTHERWISE NOTED

COMPUTER TERMINAL OUTLET – VERIFY EXACT NEEDS–PROVIDE SIGNAL AND POWER OUTLET AS REQUIRED


SPEAKER–CEILING MOUNTED


INTERCOM OUTLET


NURSE CALL DOME LIGHT–CEILING MOUNTED


NURSE CALL DOME LIGHT–WALL MOUNTED


NURSE CALL DUTY STATION


EMERGENCY NURSE CALL


NURSE CALL STAFF STATION


VOLUME CONTROL–WALL MOUNTED


JUNCTION BOX–PURPOSE AND LOCATION AS NOTED

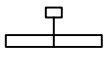

SUPPLY AIR DIFFUSER


EXHAUST OR RETURN AIR REGISTER OR GRILLE


EMERGENCY EXHAUST GRILLE


THERMOSTAT


HUMIDISTAT


COMBINATION FAUCET HOSE BIBB

V □ VACUUM

A □ MEDICAL AIR

O □ OXYGEN

ELECTRICAL STRIP MOLD – NEMA 5–20R RECEPTACLES AT 600MM (2"–0") INTERVALS

SINGLE POLE SWITCH


SINGLE POLE SWITCH – SUFFIX OF a,b OR c INDICATES SEPARATE CONTROL OR FIXTURES WITH SAME DESIGNATION


DIMMER SWITCH


THREE WAY SWITCH


DOOR SWITCH

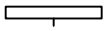

FUSED OR UNFUSED DISCONNECT SWITCH


EMERGENCY POWER OFF (EPO) PUSH BUTTON


2'x2' FLUORESCENT FIXTURE


1'x4' FLUORESCENT FIXTURE


2'x4' FLUORESCENT FIXTURE


WALL–MOUNTED FLUORESCENT FIXTURE


2'x2' FLUORESCENT FIXTURE–EMERGENY POWER


2'x4' FLUORESCENT FIXTURE–EMERGENY POWER


WALL MOUNTED FLUORESCENT FIXTURE–EMERGENY POWER

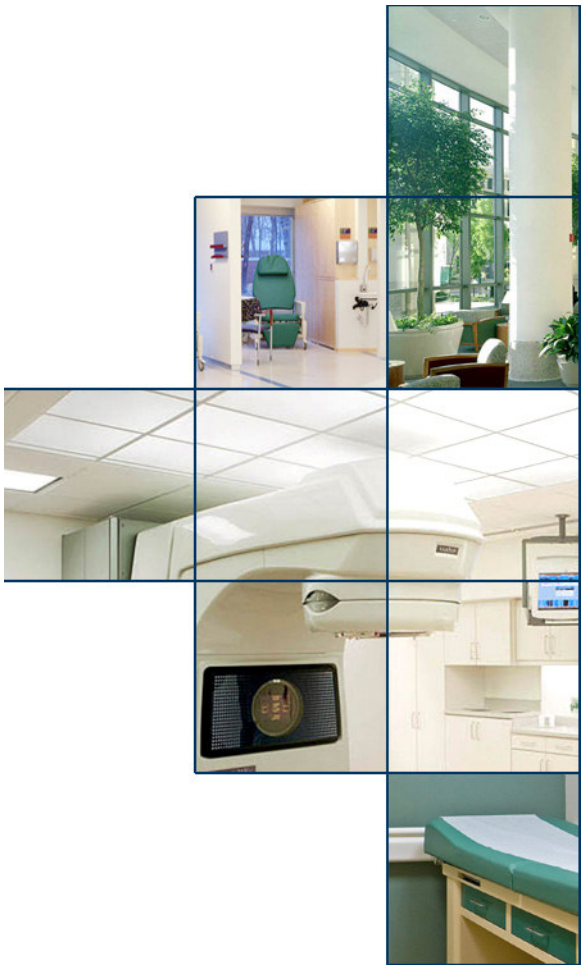

WALL MOUNTED LIGHT FIXTURE–TYPE AS NOTED

LIGHT FIXTURE–TYPE AS NOTED

LIGHT FIXTURE–TYPE AS NOTED EMERGENCY POWER


CIRCUIT BREAKER


BATTERY POWERED CLOCK



Section 2: Narrative

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General Considerations

Overview

What is Radiation Therapy?

Radiation Therapy is a clinical specialty that employs radiation to treat cancer and other medical conditions. Two types of Radiation Therapy are available; External Radiation Therapy and Internal Radiation Therapy. External Radiation Therapy utilizes high-energy penetrating wave or particle beams that are used to damage or destroy cancerous cells. External Radiation Therapy may also be used as a form of treatment for some non-cancerous diseases, and is frequently delivered on a recurring outpatient basis. High-energy beams do not leave the patient 'radioactive' and there are no concerns about exposure of the patient to other persons post-treatment.

Internal Radiation Therapy employs the use of low-level radioactive implants or 'seeds' to deliver radiation to local tissue structures. Frequently implanted in tumors, the radioactive decay damages or destroys the immediately surrounding tissue. Implants are specifically chosen to match the proscribed radiation dose necessary to damage the tumor while protecting the surrounding healthy tissues. Radioactive implants are placed surgically. Depending upon the implant's intensity, patients may be 'radioactive' for a period of time post-implantation and may need to remain in hospital, segregated from others until the radioactive decay reduces the strength of the implant.

Current Trends

Radiation Therapy has been used as a cancer treatment for more than 100 years. Advances in technology during the 1970's have set the stage for today's treatment methods and equipment. Current methods of Radiation Therapy include the use of 3 dimensional data collection, the use of computer aided treatment planning, and the use of highly accurate radiation delivery equipment. This methodology attempts to identify where cancer is located, determine the best method of treatment, and deliver controlled radiation that targets the cancer while maintaining healthy surrounding body tissue.

Stereotactic Radiosurgery is currently being performed to treat tumors with a precise delivery of a single, high dose of radiation. This one-session treatment has such a dramatic effect in the target areas that the resulting changes are considered "surgical." This may be performed using a specially configured Linear Accelerator or a Gamma Knife. Radiosurgery performed with a Gamma Knife is limited to treating disorders of the head and neck while treatments using a Linear Accelerator may address the whole body. Cyber Knives have been developed as another method of treating disorders located in areas other than the head and neck. Currently this technology is limited to a few centers of excellence, but it is anticipated that more facilities will provide this treatment as the cost of the equipment is reduced.

Picture Archiving and Communications Systems (PACS) has become the VA standard for the capture, transfer, storage, and manipulation of diagnostic images. These systems consist of workstations for image interpretation, a web server for distribution, printers for file records, image servers for information transfer and handling, and archive systems for off-line information storage.

Future Trends

Advances in technology will continue to improve methods of Radiation Therapy. It is anticipated that imaging modalities, such as CT, PET, and MR, will merge to provide more precise delineation of tumors and improve treatment planning. This will allow for more intense and focused treatment of tumors without affecting surrounding tissue; a major goal in Radiation Therapy. Technology advances in precision and resolution of images will continue with the PACS systems deployment at Radiation Therapy areas. Improvements in equipment positioning systems accuracy and automation will provide greater targeting performance. In the future, Radiation therapists will be able to more accurately target, deliver, and verify treatment.

Functional Considerations

Operations

Radiation Therapy is a referral-based treatment service. Treatments include external beam therapies and internal implant therapies. These may be in conjunction with other treatments such as chemotherapy, surgery, and hormone therapy that are not performed in the Radiation Therapy service areas. Support functions for may be shared between Radiation Therapy Services and Nuclear Medicine Services.

Treatment Process

The patient is referred for Radiation Therapy.

Upon arrival, the patient is received, their records are verified, and the patient is directed to either outpatient or inpatient waiting.

Prior to treatment, patients may gown and be taken for simulation imaging in anticipation of treatment planning. Following simulation, a treatment plan is devised.

Once a treatment plan is developed, a schedule of therapy is outlined.

For external radiation therapy, a series of treatments are scheduled; typically on an outpatient basis. The patient arrives for their treatment, may be gowned, receive the treatment, and leave.

Periodically, new scans may be performed to determine the effectiveness of the current treatment. Based on the results of these scans, the treatment plan may be revised to accommodate changing conditions.

Patient Care Concept

Effective diagnosis and care of cancer patients require an interdisciplinary approach to clinical programs and involves multiple screening, diagnostic, and treatment modalities. Family participation is common during the treatment planning process and should also be accommodated in the treatment process itself. This includes assistance in driving, parking, and help with dressing and mobility.

Providing convenient access to treatment in a non-institutional, non-threatening environment is an objective of the Radiation Therapy Service. Ease of access is particularly important due to the frequency of treatment commonly prescribed by the treatment plan. The provision

of a healing environment is critical to cancer patients who are dealing with the stress of a potentially life-threatening condition. Patient education and family consultation may be used to further aid in a positive patient outcome.

Patient Base

VA Radiation Therapy facilities are focused upon serving the Veteran and may include sharing agreements, joint ventures, and referrals. The aging veteran patient population with comorbidities and increased severity of illness necessitate design features that emphasize safety and prevention of risks.

Medical Records

Diagnostic evaluations and treatment records generated within the department become part of the Veteran's Consolidated Health Record. Evaluations are communicated to the ordering physician in electronic form. Image manipulation, interpretation, archiving, retrieval, and distribution procedures may occur within Radiation Therapy or remotely.

Patient Protocol

Initial patient appointments are established through a referral network. Multiple scheduled visits are planned over the therapy period. Scheduled visits are included for assessment, counseling, treatment planning, therapy sessions, examination, and follow-up.

Special Requirements

Teaching facilities may require more technical support space including space to accommodate small groups in control rooms, treatment planning, and consultation areas. PACS viewing spaces and remote viewing screens need to be factored into these spaces.

Space Planning Issues

Radiation Therapy is typically a stand-alone unit to maximize privacy for patients and families. However, in new facilities, options should be explored to share space and staff with other diagnostic imaging modalities.

Appropriate staff and support spaces and their proper functional adjacencies must be clearly defined and understood early in the planning and design process in order to achieve operational efficiency. Flexibility and adaptability should be anticipated within the design of the facility to accommodate evolutions in technology. Way-finding should be clear, and easy access provided to outpatients who are stressed and often weakened due to their illness. Patient privacy and dignity is a prime consideration in the design of Radiation Therapy.

Shared staff support facilities including staff lockers, lounges, inpatient holding, and registration should be considered. Shared patient support facilities are not recommended due to the nature of the patient's illness.

Flexibility

The physical mass requirements to accommodate the radiation shielding often restrict the location of Radiation Therapy Facilities to lower floor locations. Shielding requirements also

place demands on space. If an entrance maze is required it should be designed to minimize shielding while providing convenient access of a stretcher and equipment to the treatment room. Radiation Therapy Facilities need to be placed where they will not impede expansion of the surrounding services. Due to the permanent nature of these facilities, flexibility in design is important to provide for advances in technology. Increased space allocation and shielding in excess of vendor minimums outlined at the initial design will help to provide this flexibility for the future. Close coordination between the equipment vendor, the designers, and the Radiation Therapy Physicists is critical during the design process.

Human Factors

The VA is committed to providing a healthcare facility that includes components that create a healing environment. It is important that the design of Radiation Therapy reinforces this concept. Patient's vulnerability to stress from noise, lack of privacy, poor lighting, and other causes, and the harmful effects it can have on the healing process is well known and documented. Patient dignity and self-determination should be accommodated while considering operational efficiencies. Security is addressed by planning, design, and detail considerations. Handicap accessibility is accommodated by the application of ABA and ADA design guidelines to space and fixed equipment layouts.

De-emphasizing the institutional image of traditional health care facilities and surrounding the patient and family members with architectural finishes and furnishings that are familiar and non-threatening should be a prime objective. It is important to remember, however, that this is a healthcare environment and ease of maintenance, durability, and sanitation should be primary considerations when selecting materials and finishes. An inherent opportunity exists in the design of Radiation Therapy to address these issues and put forth creative solutions that enhance patient comfort and contribute to positive outcomes.

Treatment

Radiation Therapy commonly maintains two patient care areas; treatment planning and radiation treatment. Treatment planning with assessment and evaluation generally occurs during the patient's initial visit. After a treatment approach is determined, the patient generally accesses the treatment area repeatedly during the course of treatment.

Patient Access / Way-finding

Travel distance from parking and main patient entrance to Radiation Therapy Service waiting should be minimized due to the frequency of patient access. Consideration should be given to co-location of Radiation Therapy with other diagnostic facilities which may assist in way-finding and coordination of patient service.

Organizational Concepts

The spatial organization of Radiation Therapy is predicated on four functional areas. These areas are Reception, Patient Care / Treatment Planning, Support, and Staff and Administration.

The reception area controls access to the patient areas and prevents unauthorized access to the department.

Outpatient waiting areas should be separate from inpatient waiting areas. Outpatients are typically accompanied by at least one family member or visitor who will also require waiting space.

High volume services within the patient service areas should be located near the Waiting Areas to facilitate ease of patient access.

Patient areas should be consolidated to control patient access and to maintain patient privacy, security, and dignity.

Referral, treatment planning, consultation and interpretation areas should not accessible to patients and should be private staff work areas to maintain patient confidentiality.

Patient and Staff circulation should be separated. Staff functions may be located within the service or in a convenient location that is shared with another service.

Locate clean and soiled utility functions close to the patient areas they support.

Infrastructure Support areas (e.g., electrical and telecommunications rooms) should be located in proximity to the Radiation Therapy Suite.

Functional Adjacencies

Radiation Therapy should be located close and on the same floor as the Radiology Service.

Close but a different floor location is acceptable for the following services:

Ambulatory Care

Audiology and Speech Pathology

Intensive Care Nursing Units

Medical Research and Development Service

Surgical Service

Technical Considerations

General

Seismic

Where required, install all components and equipment with seismic provisions as outlined in the various discipline specific VA Design manuals for healthcare projects. Refer to VA Construction Standard Handbook PG-18-03 (CD-54), “Natural Disaster Resistive Design Nonstructural” for additional information.

Mycobacterium Tuberculosis

Current Center for Disease Control (CDC) requirements for design of public areas within the building to accommodate Mycobacterium Tuberculosis patients must be addressed by architectural and mechanical disciplines. Check current requirements with the VA task force on transmission of Mycobacterium Tuberculosis, TB criteria in HVAC Design Manual for Hospi-

tal Projects, and the CDC Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Healthcare Settings, 2005.

Sustainability

In 2006, the Department of Veterans Affairs joined other Federal agencies who are participating in principles outlined in the Memorandum of Understanding for the Federal Leadership in High Performance and Sustainable Buildings. The purpose of these guidelines is to encourage the use of life cycle concepts, consensus-based standards, and performance measurement and verification methods that utilize good science and lead to sustainable buildings. The goals of the members of this initiative are to establish and follow a common set of sustainable Guiding Principles for integrated design, energy performance, water conservation, indoor environmental quality, and materials aimed at helping Federal agencies and organizations:

Reduce the total ownership cost of facilities.

Improve energy efficiency and water conservation

Provide safe, healthy, and productive built environments

Promote sustainable environmental stewardship

These principles should be addressed in the design of all VA facilities.

Architectural

Interior Materials and Finishes

Partitions

Interior partitions should be primarily painted gypsum wallboard on metal studs. Partitions enclosing physician offices, and exam rooms should be provided with sound attenuation batts between the studs in accordance with H-18-03, VA construction standard CD 34-1, Noise Transmission Control.

Partitions for CT Simulator areas will likely require shielding. Partitions around Linear Accelerator equipment will require significant quantities of shielding. Partitions may be constructed of high-density concrete (or other materials) and finished with furred gypsum wallboard.

Floors

Floors in offices, conference rooms and waiting areas should be carpet with a 4 inch high resilient base. Floors in toilet rooms should be ceramic tile with a ceramic tile base. Floors in exam rooms, treatment rooms, and most other spaces should be vinyl composition tile with a 4-inch high resilient base. Floor trenching and special floor boxes may be required for Radiation Therapy equipment. Identify area where floor trenching is required to receive equipment infrastructure.

Ceilings

Ceilings should be primarily lay-in acoustic ceiling tile. Certain areas, such as procedure rooms and treatment rooms, should have lay-in acoustic ceiling tile with a washable sprayed plastic finish. Coordinate the ceiling height requirements with the equipment manufacturer.

Wall Protection

Wall and corner guards should be used in corridors and all other areas where damage from cart and stretcher traffic is anticipated.

Interior Doors and Hardware

Interior doors should be 1 ¾ inch thick solid core flush panel wood doors or hollow metal doors in hollow metal frames.

Doorjambs, except in rooms with radiation shielding, should have hospital type sanitary stops that stop 8 inches from the floor to facilitate mopping. Hollow metal doors should be used where high impact is a concern and where fire rated doors are required. Kick / mop plates should generally be applied to both sides of the doors. Handicapped accessible hardware should be used throughout. Door interlocks are provided and coordinated with the hardware. Refer to VA Handbook PG-18-14, Room Finishes, Door and Hardware Schedule, for additional information.

Radiation Therapy Treatment

The treatment unit is commonly housed in a reinforced concrete, radiation shielded vault with an entry maze. Direct entry is also an option. The vault is entered through a special electro-pneumatic operated neutron shielded door. The configuration of the maze and vault, and the types and thicknesses of shielding materials shall be as prescribed by a registered radiological physicist approved by the American Board of Radiology in accordance with the National Council of Radiation Protection standards and regulations.

Floor materials should be a seamless sheet product with an integral cove base. Wall and ceiling finish materials should be selected for durability and ease of maintenance.

Due to the nature of treatment in this area with the potential for increased patient anxiety, effort should be made to provide a calming environment. This may be achieved through the use of innovative design features. One example is the inclusion of a backlit photo mural as part of the ceiling assembly to create a diversion during treatment. Another is the use of color to provide a calming and non-institutional environment.

Radiation Therapy Space Allocation

Radiation Therapy space requirements are outlined in the VA Handbook 7610 Chapter 277 – Radiation Therapy Service.

Film Processing

It is the goal of the VA to implement Picture Archiving and Communications Systems (PACS) in all VA healthcare facilities. As this conversion to PACS is implemented, some existing fa-

cilities are currently utilizing conventional film processing. It is anticipated that any significant renovation will include conversion to PACS as a basis for design.

Structural

General

Obtain equipment data sheets for each type of equipment under consideration. Proportion structural elements to meet strength and serviceability requirements established by equipment manufacturers.

Shielding

Shielding associated with this equipment is very massive. Protecting adjacent occupancies typically requires several feet of reinforced concrete. Placing this occupancy on grade and isolating its mass and stiffness from the overall building lateral system is recommended. Proportion structural elements to meet shielding requirements prescribed by the radiological physicist.

Equipment

Casework

Casework may be millwork or modular. Casework systems should be chosen that provide flexibility for planning and utilization purposes. Casework systems should incorporate components dimensioned for ease of multiple re-use installation applications. Casework used for the storage of molds and immobilizers should be designed to accommodate the wide variety of shapes and sizes and their unique storage needs. Casework systems should provide for cable management and ergonomic placement of workstations and flat screen monitors.

Information Management Systems

Information Management Systems shall include elements of image retrieval, processing, storage, treatment planning, electronic patient records including patient registration, patient charges, physician order entry, and patient / staff movement. Additional shielding may be required to prevent interference with the electronic signals. These systems elements will require access to the main facility information system as well as the departmental local area network. A standardized structured cable system and pathway system are provided to facilitate current and future network access. All components should be planned for compatibility.

HVAC

When HVAC services must penetrate a shielded enclosure, coordination is required between HVAC design and the health physicist certifying the construction documents.

Operation

Air conditioning systems should be provided to heat, cool and ventilate the individual spaces, as required to satisfy the VA design criteria.

Capacities

The number of people and the air conditioning load noted on the room design standard sheet is for the purpose of establishing the basis of design guide and its use in planning. Verify the actual number of people and the air conditioning load to agree with the project requirements.

Verify equipment AC loads based on the actual equipment furnished on the project.

Air Quality and Distribution

All simulation, treatment and equipment rooms not required to be under negative pressure shall have positive air pressure with respect to the adjoining areas. This is to help maintain a reduced dust environment with respect to the electronic equipment.

The transferred air should be no more than 150 cfm (71.0 Liters/second) per undercut door.

Design of air distribution system shall be in accordance with criteria given in the HVAC Deign Manual. Provide linear diffusers for the spaces qualified to receive linear diffusers.

Mycobacterium Tuberculosis – Refer to General Comments

Seismic – Refer to General Comments

Noise Level

Select HVAC equipment, ductwork and air distribution devices to achieve noise levels listed in the VA HVAC Design Manual.

Plumbing

Water and Waste Systems

The plumbing systems should be provided to satisfy the departmental plumbing needs. The department domestic cold water should be piped to all plumbing fixtures and equipment requiring this utility.

The department domestic hot water should be piped to all plumbing fixtures and equipment requiring this utility. A hot water return system should be provided to ensure the design temperature at the farthest outlet. The department plumbing fixtures and drains should be drained by gravity through soil, waste and vent stacks. In addition, the department special waste should be drained through corrosion resistance flame retardant piping into either a local or centralized acid dilution tank.

Medical Gas Systems

The department medical gases outlets are shown to establish the basis of design guide and its use in planning. The engineers/designers shall verify the medical gases location and quantities for individual projects.

Electrical

Illumination

Illumination is typically provided utilizing recessed fluorescent luminaries with acrylic prismatic lenses. The fixtures typically use F32T8 lamps in compliance with the National Energy Policy Act of 1992, with subsequent revisions in 1998 and 2005. Lamps have a minimum color rendering index (CRI) of 85 and a color temperature of 4100 degrees Kelvin (K), which is close to the "cool white" color temperature of 4150 degrees K. Dimmable fixtures are normally used for setup lighting, allowing adjustment of the illumination intensity by the therapist while alignment of the patient to the laser positioning location is facilitated. Lighting intensities conform to the VA design criteria, the IES Lighting Handbook, and ANSI/IESNA RP-29-06, the Recommended Practice: Lighting for Hospitals and Healthcare Facilities.

Lighting is typically controlled by wall mounted switches located at the entrance to the room. Dimmer switches are utilized for variable lighting levels in control and treatment areas. Larger spaces may utilize multiple switching by separate switches for lighting of individual zones or areas. Rooms utilized for viewing will typically have direct / indirect lighting systems for visual comfort, reduced glare, reading accuracy, and critical determinations. Dimmer switches are utilized for the variable illumination level.

For Radiation Therapy rooms, fixed or mobile procedure lighting may also be required. Lighting fixtures utilized in rooms which require special shielding should have proper shielding provisions per the specific radiation shielding requirements.

Power load densities for lighting are listed by use for the mechanical HVAC load calculation purposes. Load densities should be verified for the actual design, as they may vary depending on the room configuration, fixture types, lamps and ballasts used.

Power

Each Hospital determines which specific equipment needs to function during a power outage and be connected to emergency power. Radiation Therapy power requirements have to be specifically coordinated with the equipment manufacturer. Separate power feeds may be required for Radiation Therapy computer equipment, power conditioners, and air conditioning systems. General purpose duplex receptacles are typically provided on each wall of a room or space. Workstations with personal computers (PC's) are typically provided with quadraplex receptacles for the PC, monitor, printer, or PACS workstations.

Duplex receptacles on the critical branch of the emergency power system are provided for selected pieces of equipment (such as refrigerators and PCs) to allow for limited operation during a power outage. All receptacles essential to the specific procedure should be on the critical branch, while the selected Radiation Therapy equipment is on the equipment branch. If the modality is used for interventional or emergent imaging, provide emergency power receptacles as required to support critical equipment and patient care.

Junction boxes are provided for equipment requiring a hardwire connection. Provide shielding behind all boxes and other penetrations in shielded scanning room surfaces. Certain modular casework units are provided with a utility access module with surface mounted electrical pre-manufactured raceways, which provides a chase for wiring. Conduits and junctions boxes are provided to connect to the utility access module for power wiring.

Power conditioning and uninterruptible power supplies equipment may be required for Radiation Therapy equipment, computers, or PACS workstations, where an interruption of power would not be acceptable during a specific procedure. Power conditioning and UPS equipment require physical space, working clearances, maintenance access, cooling / ventilation access, and coordination with casework.

Power and grounding of modern medical electronic equipment, computers, and displays requires careful consideration of power quality principles. The basic need for proper voltage and frequency is supplemented by other power quality concerns including:

- Source and load compatibility.
- Distortion of voltage and current wave forms by harmonics present in the power systems.
- Sensitivity and susceptibility of electronic equipment loads to interruptions, surges, harmonic wave form distortions, and noise (RF, EMI, etc.).

Power systems and equipment characteristics need to be evaluated to determine effective solutions to reduce the potential sources of interference, reduce the susceptibility of the load equipment, or to apply power conditioning equipment (IEEE Std. 1100-1999, the IEEE Recommended Practice for Powering and Grounding Electronic Equipment).

Security and Access Control

Security and access control requirements may apply to selected areas of the Radiation Therapy Suite. Specific Patient Privacy and HIPPA requirements may affect IT system components location, separation from non-secure components, and local staff screen or display orientation. Radiation Materials storage rooms and cabinets, and PACS server rooms and other critical IT infrastructure areas may require access control systems. Radiation detectors and alarms may be required at selected areas of Radiation Therapy.

Life Safety

Purpose

The life safety program should be developed to provide a reliable system to protect the building occupants, firefighting personnel, building contents, building structure, and building function. This can be accomplished by limiting the development and spread of a fire emergency to the area of origin and thereby reduce the need for total occupant evacuation.

The design aspects of the facility which relate to the fire and life safety include:

Structural Fire Resistance

Building Compartmentalization

Fire Detection, Alarm and Suppression

Smoke Control and Exhaust

Firefighter Access and Facilities

Emergency Power;

Emergency Egress Lighting

Exit Lighting

New hospital construction and renovated areas of existing facilities are required to be fully protected by an automatic fire suppression system.

The minimum width of corridors and passageways in Radiation Therapy areas is 5'-0" in areas used by staff. The minimum width of corridors in areas used by inpatients is 8'-0"

Provide handrails on both sides of the corridors in patient areas.

Nurse control areas are permitted to be open to the corridors.

Waiting areas are also permitted to be open to the corridors.

Refer to the latest editions of NFPA 101 "Life Safety Code", International Building Code and additional standards published by the National Fire Protection Association (NFPA).

Energy Conservation

The HVAC, Plumbing, Power and Lighting Systems should be designed for overall energy efficiency and lowest life-cycle cost. This should include the use of high efficiency equipment and fixtures and a programmable control system. The minimum energy standard shall be the latest edition of ASHRAE/IESNA Standard 90.1.

Communications

Telephone

Telephone outlets are typically provided at each workstation or in each room. Desk outlets are 18" AFF and wall phone outlets are 48" AFF. Desk outlets may be combined with modular data ports into a single-gang outlet. Certain modular casework units are provided with a utility access module that houses communication outlets and provides a chase for cabling. Infrastructure will be extended to local telecommunications room via available pathways utilizing cable tray, sleeves through fire / smoke partitions, and conduit stubs / backboxes to work area. Conduits and junction boxes are provided to connect to the utility access module for telephone service. Current technologies such as "voice over internet protocol", or VoIP, and IP wireless systems require coordination with the ADP/LAN telecommunications infrastructure.

Automatic Data Processing (ADP)

ADP, or computer outlets, are typically provided at each workstation with a personal computer (PC) and/or printer. ADP includes local area networks (LAN's), PACS applications, and wireless LAN's (WLAN). Desk outlets are 18" AFF. Multi-port telecommunications outlets are provided in accordance with BICSI and ANSI-EIA/TIA standards for telecommunications. Infrastructure will be extended to local telecommunications room via available pathways utilizing cable tray, sleeves through fire / smoke partitions, and conduit stubs / back-

boxes to work area. Certain modular casework units are provided with a utility access module that houses communication outlets and provides a chase for cabling. Conduits and junction boxes are provided to connect the utility access module for ADP service. Cable and jack identification and color coding are essential to proper administration of the ADP systems.

Public Address

The Radiation Therapy department will not have an independent public address (PA) system. The department will be included as part of the hospital-wife PA system. Speakers are typically located in corridors and public spaces. The actual system configuration will depend on the overall design layout and the functional requirements.

Miscellaneous Systems

A local sound system may be provided for selected Radiation Therapy rooms to provide background music during the procedure. Nurse call and/or intercom systems may be provided for communications between the control room and the Radiation Therapy room. A closed circuit TV system may be provided for direct observation of the patient during the procedure. Other systems, such as MATV, CATV, or local digital video monitoring may be provided.

Waste Management

Medical Waste

Medical waste is generated in exam and treatment spaces where it is bagged, collected and transported to the soiled utility rooms. Then it is held in separate containers pending transport to the medical waste handling facility.

General Waste

General waste is generated in all spaces and is held in containers for collection and sorting into carts or bagged and placed in a waste chute and transported to the waste handling facility.

Recycling

Methods for sorting, collecting, transporting and disposing of recyclable products must be specifically analyzed for each facility and location.

The optional use of disposable and reusable products should be considered.

Soiled Linen

Soiled reusable linens are generated in exam rooms, treatment spaces, and patient and staff gowning areas. They are collected in carts or hampers in the soiled utility room; or bagged and transported to (a) central collection area(s) via soiled linen chutes or carts.

Disposable linens are included with either general recyclable waste or medical waste as appropriate.

Utensils

Reusable utensils include bedpans, urinals, emesis basins and other stainless steel items, which are used in exam and treatment areas. They are transported to the soiled utility room where they are processed (if steam washers are available) or collected for reprocessing and transported to the Sterile Processing Department.

Space Requirements

Space requirements will vary with the selection of waste collection and recycling methods / systems. Space requirements need to be analyzed for each optional method or system considered for new and existing facilities.

Transportation

Records

Radiation Therapy utilizes digital imaging and retrieval techniques. Viewing, interpretation and video image manipulation areas should have data communication access.

Specimens

Specimens may be collected locally in procedure rooms and transported to the pathology lab as required.

Pharmaceuticals

Pharmaceuticals, including narcotics, are transported by pharmacy personnel in locked carts or by a robotic system to the department. Narcotics are delivered to a narcotics locker which is located in a clean supply or patient prep area and is remotely alarmed to the nearest nursing control station.

Materials

Clean supplies are transported by exchange carts which are stored in the Clean Supply Room. Supplies are transported by Service Elevator and through hospital corridors separated from patient traffic where possible. Deliveries are scheduled during hours when patient visits are not schedules

Linen

Disposable linens are delivered as part of clean supplies.

Sterile Supplies

The use of sterile supplies is minimal as is accommodated by prepackaged or disposable items delivered with clean supplies.

Food

Meal and nourishment deliveries to Radiation Therapy are not required.

Waste

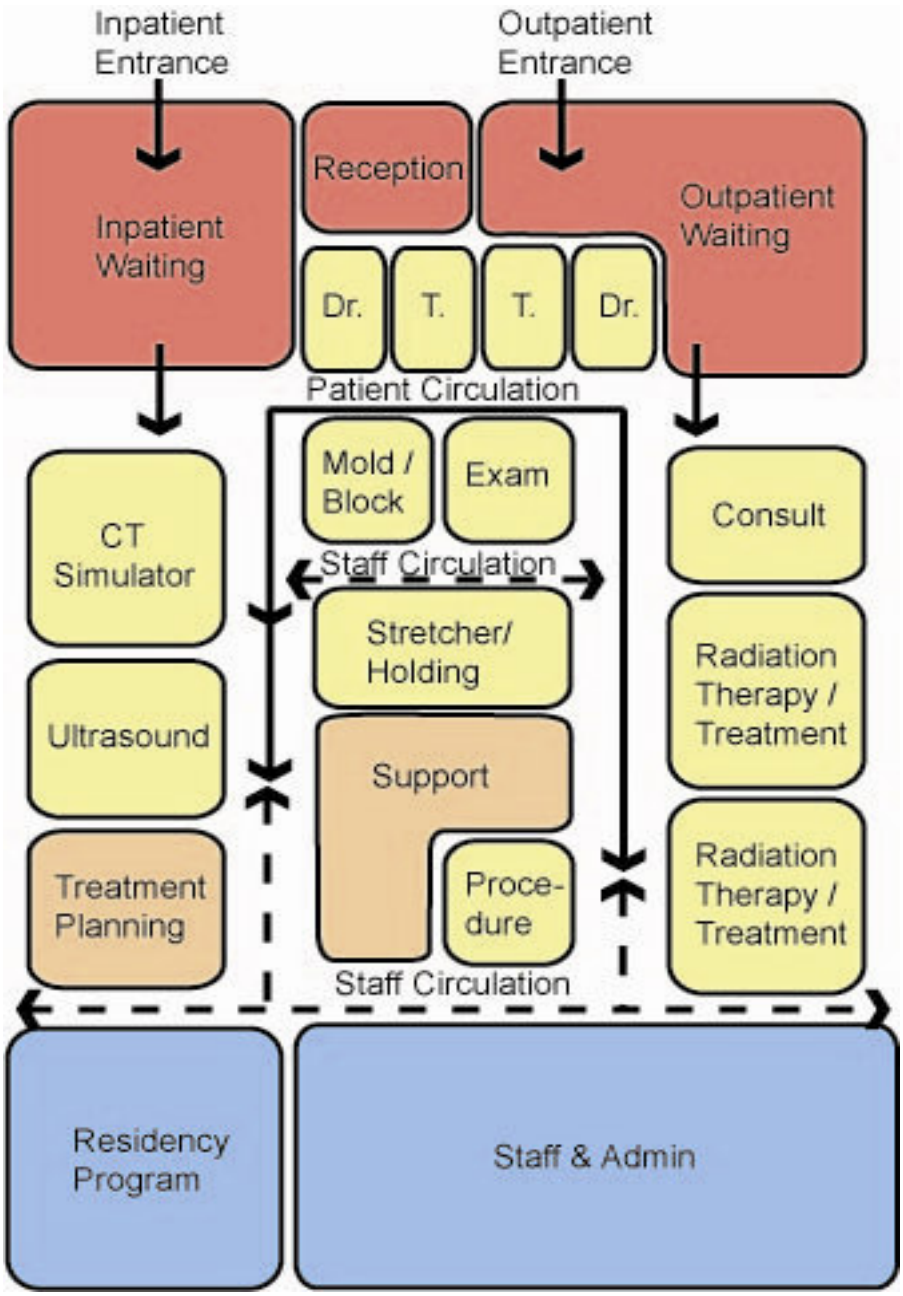
Waste is collected by housekeeping staff and transported to the Soiled Utility Room, from where it is disposed.

Section 3: Functional Diagrams

Page

Functional Diagram 3-2

RADIATION THERAPY: Functional Diagram



Section 4: Guide Plates

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Patient Areas

Linear Accelerator (IMRT) Room & Control Area 4-2

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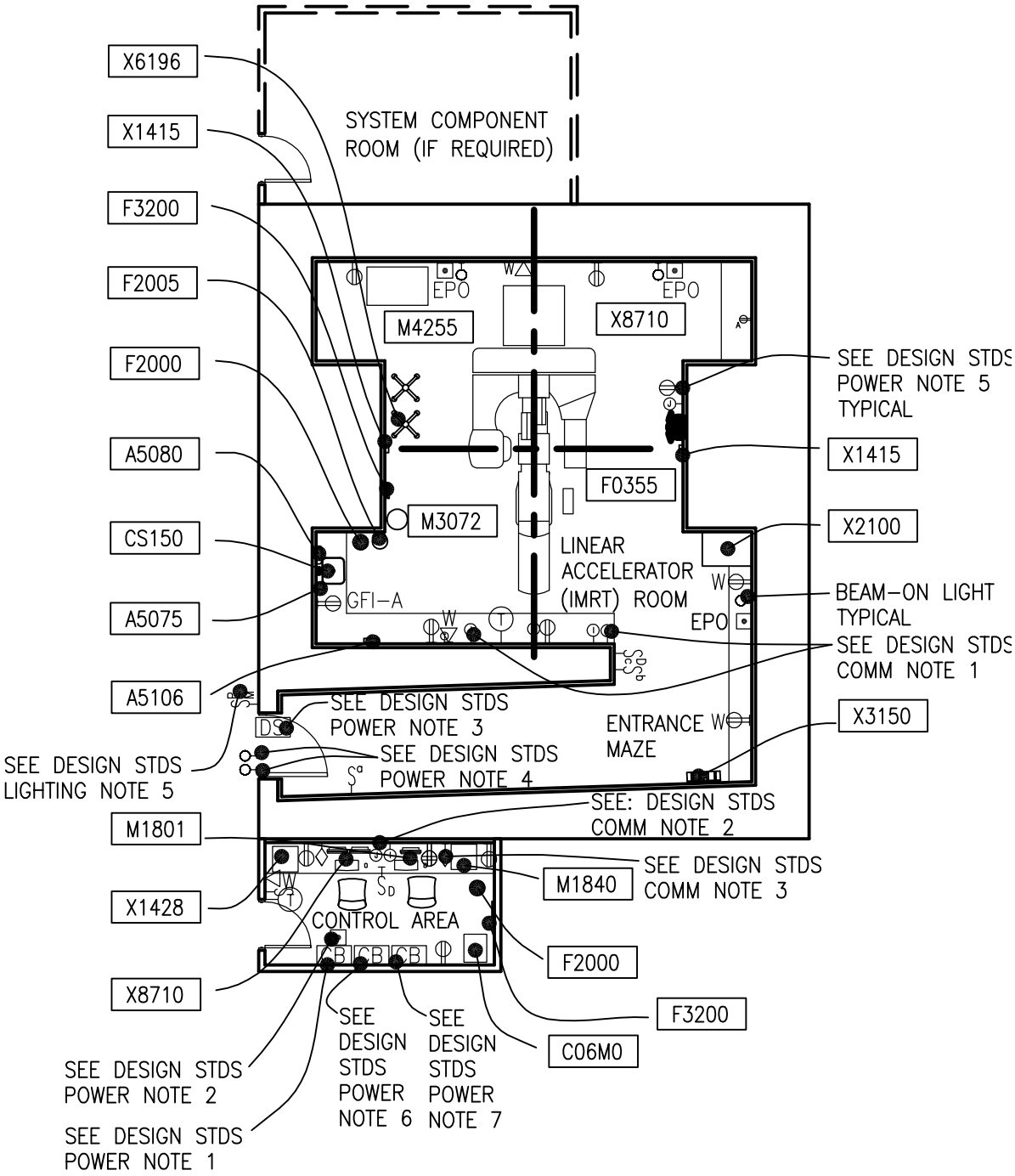
Treatment Planning Computer Room- Dosimetry Room 4-31

Linear Accelerator Room & Control Area (XTLA1) (XTLC1) 975 NSF

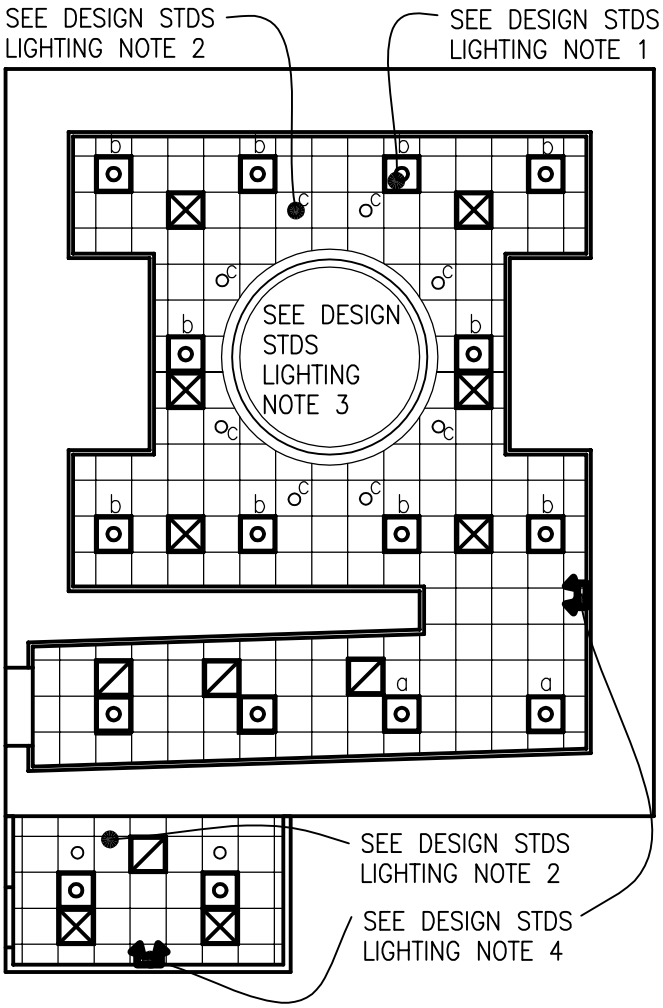
Floor Plan 90.6 NSM

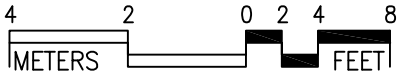


Guide plates are graphical representations of selected room types, illustrating the integration of space, components, systems, and equipment. They provide typical configurations and general technical guidance, and are not intended to be project specific. Specific infrastructure design requirements are contained in VA Design Manuals and Space Planning Criteria located in the VA Technical Information Library.

Linear Accelerator Room & Control Area (XTLA1) (XTLC1) 975 NSF

Reflected Ceiling Plan 90.6 NSM





3/32" = 1'–0"

The locations and quantities of the air outlets and inlets are tentative and may not represent the optimum design solution(s) envisioned by the designer, who shall study the layout, calculate air volumes, and may alter the arrangement shown in the reflected ceiling plan, as required, to produce a project–specific air distribution system design.

Guide plates are graphical representations of selected room types, illustrating the integration of space, components, systems, and equipment. They provide typical configurations and general technical guidance, and are not intended to be project specific. Specific infrastructure design requirements are contained in VA Design Manuals and Space Planning Criteria located in the VA Technical Information Library.

LINEAR ACCELERATOR (IMRT) ROOM (XTLA1): Design Standards

ARCHITECTURAL

Ceiling:	Acoustical Tile Ceiling
Ceiling Height:	Coordinate with Equip. Manufacturer
Wall Finish:	Paint
Wainscot:	--
Base:	Integral Cove Base
Floor Finish:	Seamless Sheet
Sound Protection:	--

Notes:

1. Provide a 4'-0" electro-pneumatic operated neutron shielded door into the Linear Accelerator Room.
2. Consider use of a special design feature to reduce the patient stress level associated with this procedure

LIGHTING

Treatment Room

General: Fluorescent lights will provide higher illumination level up to 75 FC during patient transfer on and from the table, equipment setting, room cleaning, and equipment maintenance.

Special: Incandescent dimmable 'setup lighting" luminaires controlled by dimmer will provide lower illumination levels down to 10 FC during the laser positioning and treatment. Luminaires shall be located to avoid direct glare for patient comfort.

Decorative ceiling illumination is provided for patient comfort during treatment.

Control Room

General: Fluorescent lights will provide higher illumination level up to 30 FC.

Special: Incandescent luminaires controlled by dimmer will provide lower illumination levels down to 5 FC during treatment procedure scanning for monitor viewing.

Notes:

1. 2'x2' fluorescent recessed luminaire, acrylic prismatic lens, with (3) FB031T8-U lamps, 4100 K, CRI=85 (minimum).
2. 8-inch __dia., recessed incandescent downlight, with recessed Fresnel lens, and 150W/A21 inc. horizontally mounted lamp.
3. Decorative ceiling illumination and features to be determined.
4. Dual head emergency battery pack
5. Master switch with pilot light for control of treatment room lights, set-up lights, laser positioning lights, and CCTV system via Relay box.

POWER

General: The electrical power as shown is to be used as a guide only. Equipment locations, dimensions and wiring requirements should be per the Linear Accelerator system suppliers' equipment drawings. Step down transformer, power conditioner, UPS unit may be required. Electrical trades should provide all necessary conduits, openings, bushings, nipples, flexible conduits, surface, recessed, wall mounted and floor raceways, etc., as required at the various junction boxes, duct and conduit terminations to allow proper connections of the treatment equipment and related accessories

Emergency: Emergency power for linear accelerator equipment, controls, and selected receptacles as determined by the Hospital

Notes:

1. 250V, 3P-150A main circuit breaker, with adjustable trip, shunt trip and under-voltage relay, flush mounted for linear accelerator.
2. Emergency Power Off pushbutton station; connect to shunt trip at main breaker. Do not locate in the primary beam area.
3. Door switch with NO/NC contacts. Connect to the system control circuit.
4. "BEAM ON" and 'BEAM READY" warning lights. Provide interface with controller via interface relay to match Linear Accelerator equipment requirements. Locate BEAM-ON light next to EPO.

5. Laser positioning light interlocked with room lighting and set-up lights; provide adjacent receptacle.
6. 480V, 3P-60A circuit breaker, with adjustable trip, shunt trip, flush mounted for On-Board Imager (optional).
7. 120V, 1P-30A circuit breaker for operator's console UPS unit.
8. 480V, 3P-60A disconnect switch for chiller unit; locate in field.
9. 480V, 3P-30A disconnect switch for air conditioning unit; locate in field.

COMMUNICATION/SPECIAL SYSTEMS

ADP:	Yes
Data:	Yes
Telephone:	Yes
Intercom:	Yes
Nurse Call:	--
Public Address:	--
Radio/Entertainment:	--
MATV:	--
CCTV:	Yes
MID:	--
Security/Duress:	--
VTEL:	--
VA Satellite TV:	--

Notes:

1. Junction box for CCTV camera with conduit to Control area.
2. Junction box for CCTV monitor.
3. PACS:two 4-port telecommunication outlets per PACS station

HEATING, VENTILATING AND AIR CONDITIONING

Inside Design Conditions:
70˚ F to 75˚ F (21˚ C to 24˚ C).
30% to 60% Relative Humidity

Minimum Air Changes/Hr. – Supply Air:	8
100% Exhaust:	No
100% Outside Air:	No

Room Air Balance:
Equal for Linear Accelerator Room
Positive for Control Room

Dedicated Exhaust System:	No
Occupancy:	3 for Linear Accelerator Room 4 for Control Room

AC Load-Equipment: 28,000 Btuh (8,250 W) for Linear Accelerator Room
8,000Btuh (2,400 W) for Control Room

AC Load-Lighting:
1.3 W/SF (14 W/M²) in Linear Accelerator Room
1.6 W/SF (17 W/M²) in Control Room

Notes:

1. Verify cooling loads and other specific requirements with the equipment manufacturer on a specific project.
2. Route all ductwork in vault down maze and over door to avoid radiation scatter.
3. A linear accelerator chiller is provided by the linear accelerator manufacturer . Install this chiller in accordance with the linear accelerator manufacturer's requirements.
4. Refer to HVAC Design Manual for additional information.

PLUMBING AND MEDICAL GASES

Cold Water:	Yes
Hot Water:	Yes
Laboratory Air:	--
Laboratory Vacuum:	--
Sanitary Drain:	Yes
Reagent grade Water:	--
Medical Air:	Yes
Medical Vacuum:	Yes
Oxygen:	Yes

LINEAR ACCELERATOR (IMRT) Room (XTLA1): Equipment Guide List

JSN	NAME	QTY	ACQ / INS	DESCRIPTION	SPEC
A1010	Telecommunication Outlet	AR	CC	Telecommunication outlet location.	27 31 00
A1015	Telephone, Desk, Multiple Line	1	CC	Telephone, desk, multiple line.	27 31 00
A5075	Dispenser, Soap, Disposable	1	W	Disposable soap dispenser. One-handed dispensing operation. Designed to accommodate disposable soap cartridge and valve.	
A5080	Dispenser, Paper Towel, SS, Surface Mounted	1	CC	A surface mounted, satin finish stainless steel, single-fold, paper towel dispenser. Dispenser features: tumbler lock; front hinged at bottom; and refill indicator slot. Minimum capacity 400 single-fold paper towels. For general purpose use throughout the facility.	10 28 00
A5106	Waste Disposal Unit, Sharps w/Glove Dispenser	1	W	The unit is designed for the disposal of sharps and complies with OSHA guidelines for the handling of sharps. It shall house a 5 quart container and be capable of being mounted on a wall. It shall have a glove dispenser attached. The unit shall be secured by a locked enclosure.	
A5145	Hook, Garment, Double, SS, Surface Mounted	1	CC	A surface mounted, satin finish stainless steel, double garment hook. Equipped with a concealed mounting bracket that is secured to a concealed wall plate. For general purpose use throughout the facility to hang various items of apparel.	10 28 00
C03F0	Cabinet, U/C/B, 1 Shelf, 2 Half DR, 2 DO, 36x30x22	AR	CC	Standing height under counter base cabinet with an adjustable shelf and two half width drawers above solid hinged doors. Also referred to as a combination cabinet or a drawer and cupboard cabinet. For general purpose use throughout the facility.	12 32 00
C03H0	Cabinet, U/C/B, 2 Half Drawers, 3 DR, 36x30x22	AR	CC	Standing height under counter base cabinet with two half width drawers side-by-side above three full width drawers. Also referred to as a drawer cabinet. For general purpose use throughout the facility.	12 32 00
C03J0	Cabinet, U/C/B, 8 Half Drawers, 36x30x22	AR	CC	Standing height under counter base cabinet with eight half width drawers of equal height. Also referred to as a drawer cabinet. For general purpose use throughout the facility.	12 32 00
C03P0	Cabinet, Sink, U/C/B, 2 Door, 30" W	1	CC	Standing height under counter base sink cabinet. 36" H x 30" W x 22" D with two solid hinged doors. Also referred to as a double-door sink cabinet. For general purpose use throughout the facility where a sink is to be used. Coordinate actual clear cabinet dimension with the actual outside dimension of sink that is specified to ensure that they are compatible.	12 32 00
CE030	Cabinet, W/H, 2 SH, 2 GDO, Sloping Top, 38x30x13	AR	CC	Wall hung cabinet with two adjustable shelves, solid hinged doors, and sloping top. Also referred to as a solid hinged double door wall case. For general purpose use throughout the facility.	12 32 00

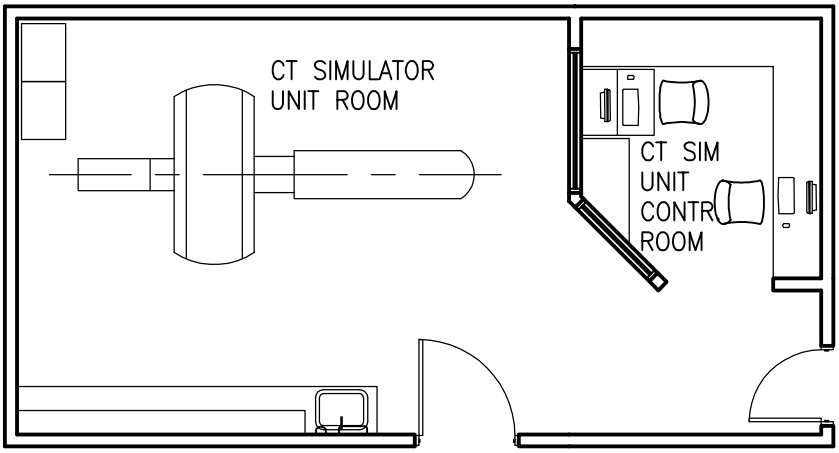
CR070	Cabinet, F/S, 5 Shelf, 1 DO, Sloping Top, 95x24x16	AR	CC	Floor standing storage cabinet with five adjustable shelves, a solid right or left-hinged door (appropriate door hinge configuration to be indicated on equipment elevation drawings), and sloping top. Also referred to as a tall case or a tall cabinet. For general purpose storage use throughout the facility.	12 32 00
CS150	Sink, SS, Single Compartment, 10x19x16 ID	1	CC	Single compartment stainless steel sink, drop-in, self-rimming, ledge-type, connected with a drain and provided with a mixing faucet. It shall also be provided with pre-punched fixture holes on 4" center, integral back ledge to accommodate deck-mounted fixtures, brushed/polished interior and top surfaces, and sound deadened. Recommended for use in suspended or U/C/B sink cabinets having a high plastic laminate or Chemsurf laminate countertop/work surface. Coordinate actual outside sink dimensions with the actual clear dimension of cabinet specified to ensure that they are compatible. For general purpose use throughout the facility.	22 44 00
CT030	Countertop, High Pressure Laminate	AR	CC	High pressure laminate countertop (composition of wood particle core with plastic laminate surface) having a hard smooth surface finish, standard thickness of 1", and a 4" butt backsplash/curb. Also referred to as a work surface or work top. Available in a wide choice of colors, patterns, and depths. Used in general purpose areas requiring a basic work surface arrangement with limited heat resistance and poor chemical resistance. Pricing based upon a 24" depth.	12 36 00
F2000	Basket, Wastepaper, Round, Metal	1	W	Round wastepaper basket, approximately 18" high X 16" diameter. This metal unit is used to collect and temporarily store small quantities of paper refuse in patient rooms, administrative areas and nursing stations.	
F0355	Footstool, Straight	1	W	Step stool. Used to assist patients getting on and off exam or surgical tables. Fitted with electrically conductive rubber tips.	
F2250	Camera, Portable, CCTV, With Recorder	1	W	Portable camera/recorder (camcorder) with video-out capacity to accommodate a remote recorder.	
F3200	Clock, Battery, 12" Diameter	1	W	Clock, 12" diameter. Round surface, easy to read numbers with sweep second hand. Wall mounted unit for use when impractical to install a fully synchronized clock system. Battery operated, (batteries not included).	
M0750	Flowmeter, Air, Connect w/50 PSI Supply	1	W	Air flowmeter. Unit has a stainless steel needle valve with clear flowtube for connection to 50 PSI air outlet from central pipeline system. Requires the appropriate adapter for connection to the wall outlet and fitting to connect to tubing. Database prices reflect fittings with an attached DISS power outlet. Other outlet and adapter configurations are available.	
M0755	Flowmeter, Oxygen, Low Flow	1	W	Oxygen flowmeter. Consists of a clear crystal flowtube calibrated to 3.5 or 8 LPM depending on manufacturer. For oxygen regulation in hospital settings. Database pricing includes DISS fitting and DISS power outlet and wall adapter. Other fitting and adapter configurations are available.	

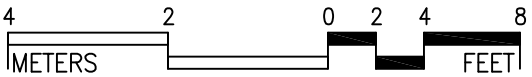
M0765	Regulator, Vacuum	1	W	An air/oxygen mixer is designed to accurately control a pressurized gas mixing with an oxygen concentration. Unit contains audible alarms to warn of supply failure, an auxiliary outlet and a oxygen concentration control adjustment range from 21% to 100%. The unit can also be used to supply an accurate pre-mixed gas source to respiration or ventilator units. A specific application may require an additional air inlet filter/water trap.	
M3072	Frame, Infectious Waste Bag w/Lid	1	W	Frame for an infectious waste collection bag. Made of heavy tubular stainless steel with heavy gauge welded steel platform. Adjust to hold 18" or 25" trash bags. Mounted on ball bearing casters and includes permanently mounted hinged lid. Provides means of bagging infectious waste at point of waste generation.	
M4255	Stand, IV, Adjustable	1	W	Adjustable IV stand with 4-hook arrangement. Stand has stainless steel construction with heavy weight base. It adjusts from 66 inches to 100 inches and is mounted on conductive rubber, ball bearing, swivel casters. Stand is used for administering intravenous solutions.	
X1415	Laser Positioning System, Patient-Wall	2	CF	Laser positioning system. This unit is designed for accurate patient alignment for radiation therapy. Three vertical laser beams and a horizontal beam intersect to define the iso-center to aid in patient positioning. The unit is generally supplied as a component of various radiation therapy systems.	
X2100	Scanner, Ultrasound, General Purpose	1	CF	High definition, diagnostic ultrasound system for Radiology, Cardiology, Vascular, ob-gyn, Perinatology, and Surgical imaging applications. The unit employs curved, phased and linear array imaging technology. The system supports colorflow, pulse and continuous wave imaging modalities. On board software measurement packages available for all imaging applications. The system is DICOM 3.0 compatible, for easy linkage to filmless image management systems and review stations. In addition, a full line of probes and conventional recording devices are available.	
X3150	Rack, Apron/Gloves, Wall Mounted	1	CC	Apron and gloves rack. This is a wall unit which holds aprons and gloves. The body is heavy gauge steel finish in gray or green baked enamel, glove and apron holding arms are aluminum. The unit's convenient on wall storage will prolong the useful life of your protection aprons by helping prevent damage to internal components.	

X6196	Injector, CT	1	CF	CT injector. This unit is a specialized radiographic system that provides sharp, well-defined visual images of the vascular anatomy. The injector introduces a vision radiopaque fluid (contrast medium) into an artery or vein through a small catheter, making vessels contrast with their more radiolucent surrounding. The unit incorporates an electromechanical or pneumatically driven syringe to deliver the contrast medium. The syringe assemblies consist of an electric motor connected to a jackscrew that moves the syringe piston into or out of the syringe barrel. The unit is used in hospitals with radiographic procedures. The unit can be ceiling, wall, or remote stand mounted.	
X8710	Accelerator, Linear, 6 MeV	1	CF	This system is a 6 MeV linear accelerator. The linear accelerator consists of four major components: a modulator, an electron gun, a radio frequency (RF) power source and an accelerator gun. The system emits a well-defined beam of uniformly intense radiation energy used to treat deep seated neoplasms and tumors.	

CT Suite

Key Plan





1/8" = 1'–0"

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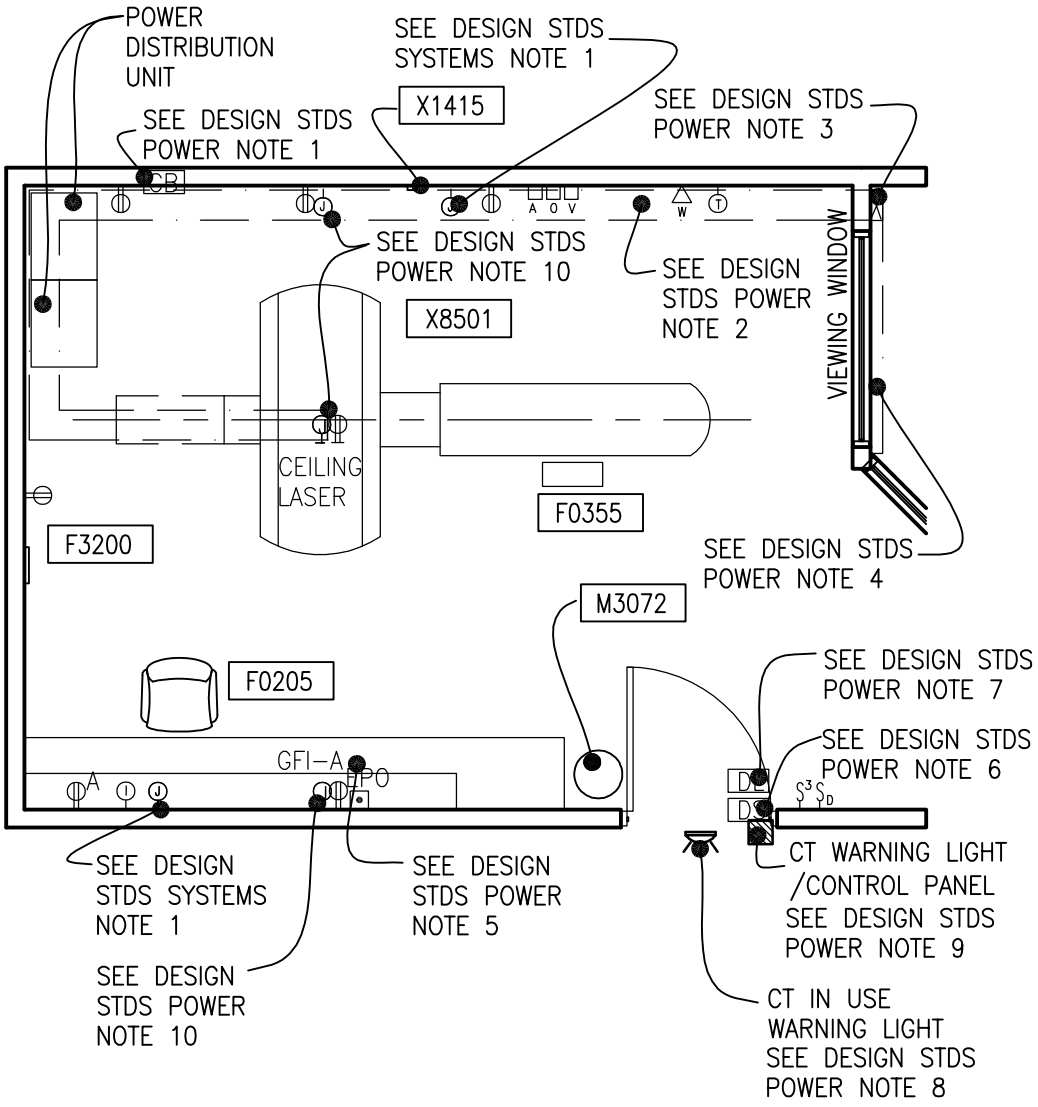
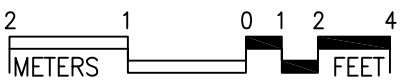
CT Simulator Unit Room (XTSG1) 400 NSF

Floor Plan 37.2 NSM





3/16" = 1'-0"

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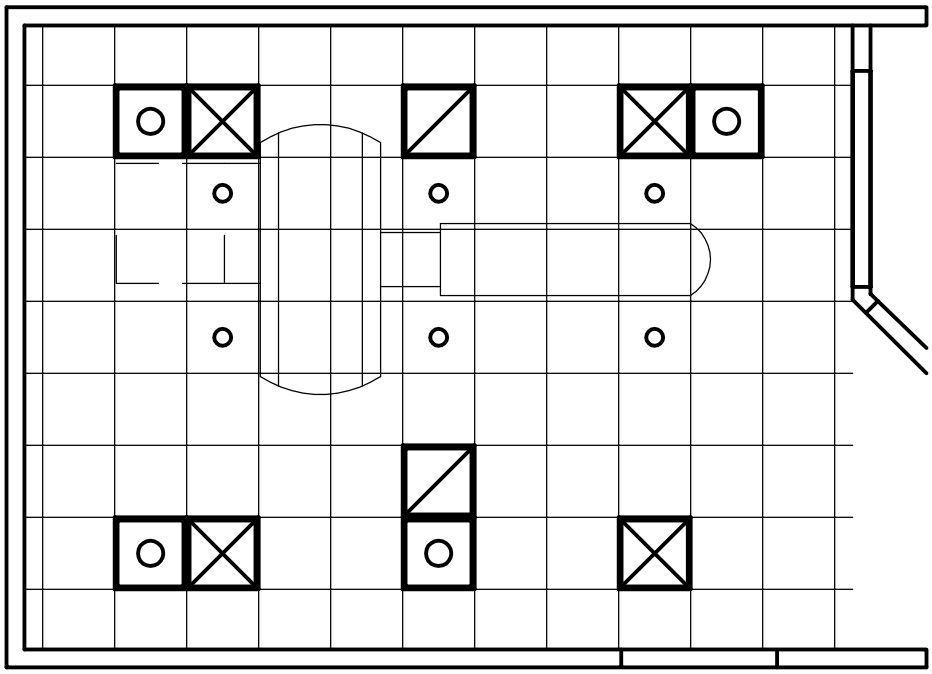
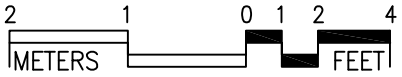
CT Simulator Unit Room (XTSG1) 400 NSF

Reflected Ceiling Plan 37.2 NSM





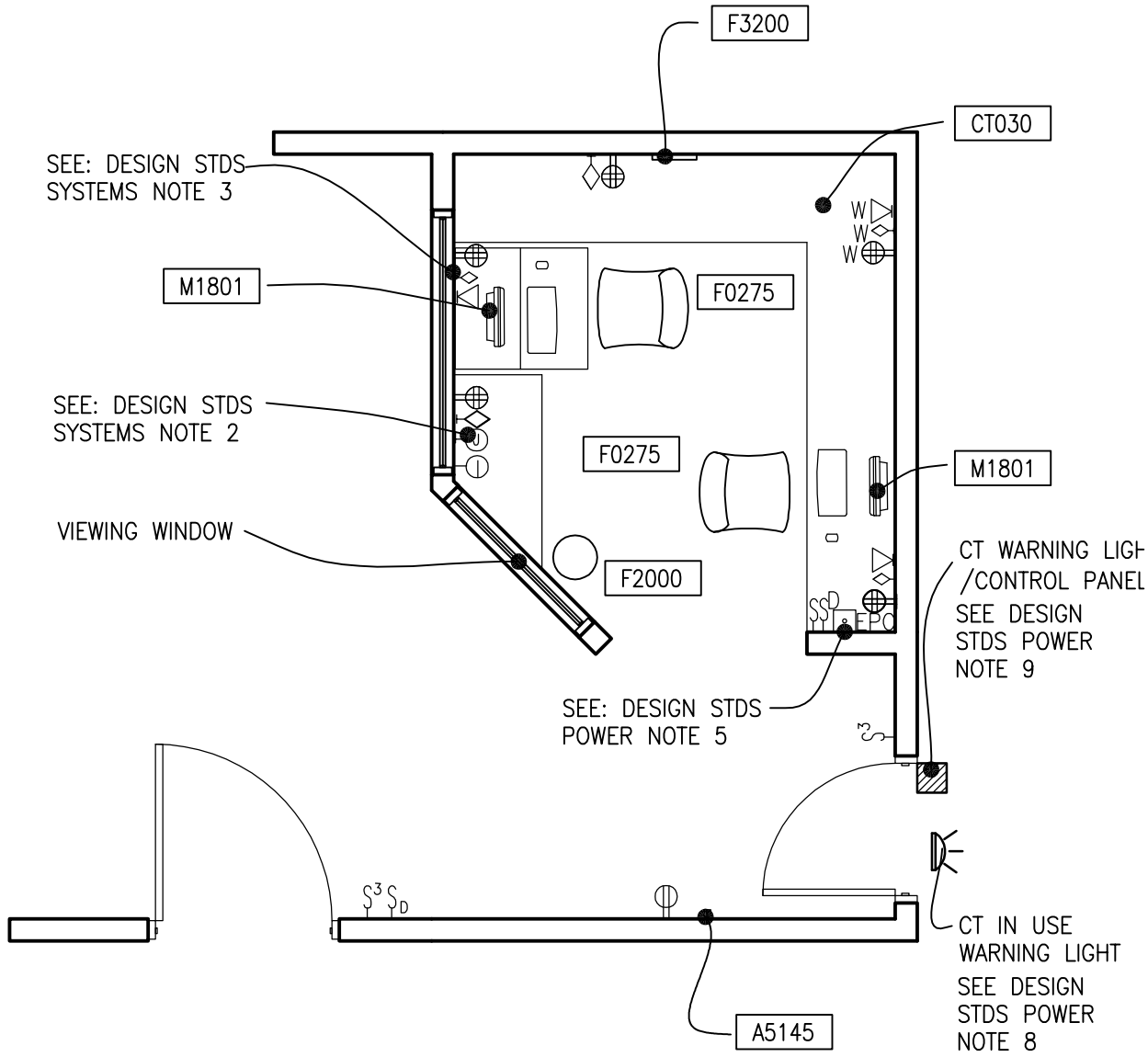
3/16" = 1'–0"

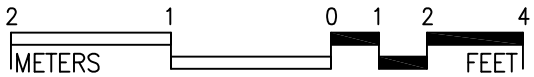
The locations and quantities of the air outlets and inlets are tentative and may not represent the optimum design solution(s) envisioned by the designer, who shall study the layout, calculate air volumes, and may alter the arrangement shown in the reflected ceiling plan, as required, to produce a project–specific air distribution system design.

Guide plates are graphical representations of selected room types, illustrating the integration of space, components, systems, and equipment. They provide typical configurations and general technical guidance, and are not intended to be project specific. Specific infrastructure design requirements are contained in VA Design Manuals and Space Planning Criteria located in the VA Technical Information Library.

CT Simulator Unit Control Area (XTSC1) 175 NSF

Floor Plan 16.3 NSM





1/4" = 1'–0"

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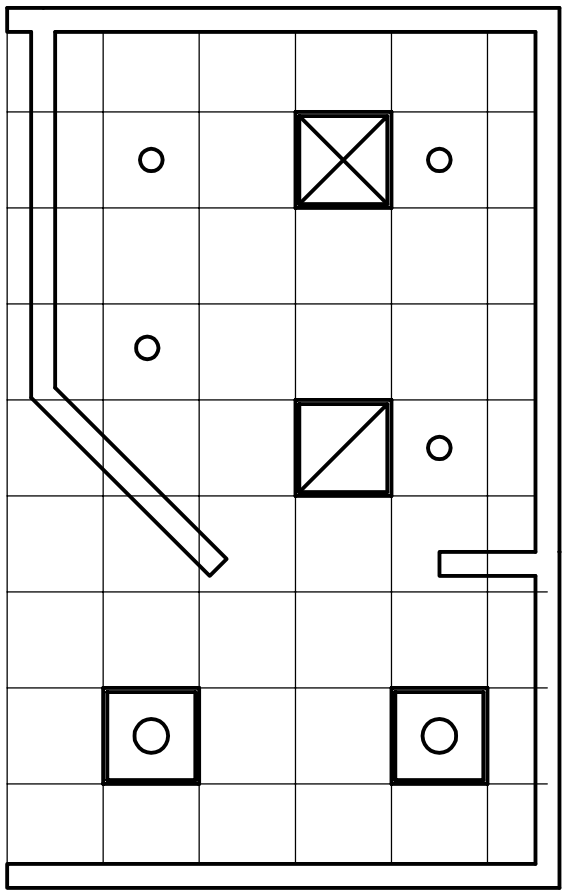
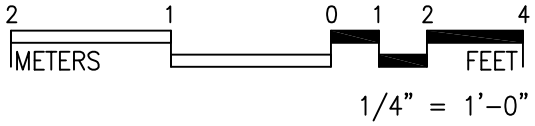
CT Simulator Unit Control Area (XTSC1) 175 NSF

Reflected Ceiling Plan 16.3 NSM





1/4" = 1'–0"

The locations and quantities of the air outlets and inlets are tentative and may not represent the optimum design solution(s) envisioned by the designer, who shall study the layout, calculate air volumes, and may alter the arrangement shown in the reflected ceiling plan, as required, to produce a project–specific air distribution system design.

Guide plates are graphical representations of selected room types, illustrating the integration of space, components, systems, and equipment. They provide typical configurations and general technical guidance, and are not intended to be project specific. Specific infrastructure design requirements are contained in VA Design Manuals and Space Planning Criteria located in the VA Technical Information Library.

CT SIMULATOR UNIT ROOM (XTSG1 & XTSC1)
Design Standards

ARCHITECTURAL

Ceiling:	Acoustical Tile Ceiling
Ceiling Height:	Coordinate with Equip. Manuf.
Wall Finish:	Paint
Wainscot:	--
Base:	Vinyl Base
Floor Finish:	Vinyl Composition Tile
Sound Protection:	--

Notes:

1. Provide a 4'-0" wide shielded door into the CT Scanning Room
2. Provide a shielded viewing window from CT Control Room to the CT Scanning Room.

LIGHTING

Simulator Room

General: Fluorescent lights will provide higher illumination level up to 50 FC during patient transfer on and from the table, equipment setting, room cleaning, and equipment maintenance.

Special: Incandescent dimmable luminaires controlled by dimmer will provide lower illumination levels down to 5 FC during the laser positioning and examination. Luminaires shall be located to avoid direct glare for patient comfort.

Control Room

General: Fluorescent lights will provide illumination level up to 30 FC.

Special: Incandescent luminaires controlled by dimmer will provide lower illumination levels down to 5 FC during scanning for monitor viewing.

Notes:

1. 2'x2' fluorescent recessed luminaire, acrylic prismatic lens, with (2) FB031T8-U lamps, 4100 K, CRI=85 (minimum).
2. 8-inch dia., recessed incandescent downlight, with recessed Fresnel lens, and 150W/A21 inc. horizontally mounted lamp.
3. 3-way switch for Simulator Room fluorescent lighting control; located at entrance door and in control area
4. Dimmer for Simulator Room incandescent downlights control.

POWER

General: The electrical power as shown is to be used as a guide only. Equipment locations, dimensions and wiring requirements should be per the CT Simulator system suppliers' equipment drawings. Electrical trades should provide necessary conduits, openings, bushings, nipples, flexible conduits, surface, recessed, wall mounted and floor raceways, etc., as required at the various junction boxes, duct and conduit terminations to allow proper connections of the simulator equipment and related accessories.

Emergency: Emergency power for Simulator equipment, controls, and selected receptacles as determined by the Hospital

Notes:

1. 480V, 3P-150A circuit breaker, with adjustable trip, shunt trip, flush mounted. Run empty 50 mm (2"C) from circuit breaker to the floor duct.
2. 12" W x 3-1/2" D multi-compartment flush floor duct with screw–on cover. Connect to vertical wall duct.
3. 10" W x 3-1/2" D multi-compartment surface vertical wall duct with screw–on cover. Connect to CT floor duct and horizontal wall duct.
4. 4-3/4" W x 3-1/2" D multi-compartment surface wall duct with screw–on cover. Connect to vertical wall duct.
5. Emergency Power Off pushbutton station. Refer to specific radiology equipment requirements for EPO. Connect to shunt trip at main disconnect.
6. Door switch with NO/NC contacts. Connect to CT system control circuit. CT should shut-off upon opening of the entrance door.

7. Magnetic door interlock with CT controller to prevent interruption of scanning procedure (optional).
8. Warning light with wording "CT IN USE, DO NOT ENTER". Provide interface with CT controller via interface relay.
9. CT warning light interface relay with low voltage power supply to match CT equipment requirements.
10. Laser positioning light interlocked with room lighting and set-up lights; provide adjacent receptacle

COMMUNICATION/SPECIAL SYSTEMS

ADP:	Yes
Data:	Yes
Telephone:	Yes
Intercom:	Yes
Nurse Call:	--
Public Address:	--
Radio/Entertainment:	--
MATV:	--
CCTV:	Yes
MID:	--
Security/Duress:	--
VTEL:	--
VA Satellite TV:	--

Notes:

1. Junction box for CCTV camera with conduit to Control area.
2. Junction box for CCTV monitor.
3. PACS:two 4-port telecommunication outlets per PACS station.

HEATING, VENTILATING AND AIR CONDITIONING

Inside Design Conditions:
70˚F to 75˚F (21˚C to 24˚C)
30% to 60% Relative Humidity

Minimum Air Changes per Hour – Supply Air:
6 for CT Simulator Unit Room and CT Control Room

100 % Exhaust:	No
100% Outside Air:	No
Room Air Balance:	Positive for All Rooms
Dedicated Exhaust System:	No
Occupancy:	4 for CT Simulator Unit Room 2 for CT Control Room

AC Load-Equipment: 17,000 Btuh to 22,000 Btuh (5,000 W to 6,500 W) for CT Simulator Unit Room
4,000 Btuh to 8,500 Btuh (1,200 W to 2,500 W) for CT Control Room

AC Load-Lighting: 2.0 W/SF (21 W/M^2) in CT Simulator Unit Room
1.5 W/SF (17 W/M^2) in CT Control Room

Notes:

1. Verify cooling loads and other specific requirements with the equipment manufacturer on a specific project.
2. Certain CT manufacturers require and provide a dedicated CT Scanner chiller. Install two chillers in accordance with the CT manufacturer's requirements.

PLUMBING AND MEDICAL GASES

Cold Water:	--
Hot Water:	--
Laboratory Air:	--
Laboratory Vacuum:	--
Sanitary Drain:	--
Reagent grade Water:	--
Medical Air:	Yes
Medical Vacuum:	Yes
Oxygen:	Yes

CT Simulator Unit Room (XTSG1 & XTSC1): Equipment Guide List

1. CT SIMULATOR UNIT ROOM (XTSG1)

JSN	NAME	QTY	ACQ / INS	DESCRIPTION	SPEC
A1010	Telecommunication Outlet	AR	CC	Telecommunication outlet location.	27 31 00
A1015	Telephone, Desk, Multiple Line	1	CC	Telephone, desk, multiple line.	27 31 00
A5145	Hook, Garment, Double, SS, Surface Mounted	AR	CC	A surface mounted, satin finish stainless steel, double garment hook. Equipped with a concealed mounting bracket that is secured to a concealed wall plate. For general purpose use throughout the facility to hang various items of apparel.	10 28 00
A5180	Track, Cubicle, Surface Mounted, With Curtain	1	CC	Surface mounted cubicle track, with curtain. Track constructed of thick extruded aluminum. Equipped with self lubricating carriers, beaded drop chain hooks, and flame resistant curtain. To include removable end caps. Designed to be suspended around patient areas where privacy is needed. Price listed is per foot of the track, curtains to be priced per quote.	10 21 23
F0205	Chair, Side With Arms	1	W	Upholstered side chair, 32" high X 21" wide X 23" deep with arms, padded seats and padded backs. Seat height is a minimum of 17". Available with or without sled base.	
F0355	Footstool, Straight	1	W	Step stool. Used to assist patients getting on and off exam or surgical tables. Fitted with electrically conductive rubber tips.	
F3200	Clock, Battery, 12" Diameter	1	W	Clock, 12" diameter. Round surface, easy to read numbers with sweep second hand. Wall mounted unit for use when impractical to install a fully synchronized clock system. Battery operated, (batteries not included).	

M0750	Flowmeter, Air, Connect w/50 PSI Supply	1	W	Air flowmeter. Unit has a stainless steel needle valve with clear flowtube for connection to 50 PSI air outlet from central pipeline system. Requires the appropriate adapter for connection to the wall outlet and fitting to connect to tubing. Database prices reflect fittings with an attached DISS power outlet. Other outlet and adapter configurations are available.	15491
M0755	Flowmeter, Oxygen, Low Flow	1	W	Oxygen flowmeter. Consists of a clear crystal flowtube calibrated to 3.5 or 8 LPM depending on manufacturer. For oxygen regulation in hospital settings. Database pricing includes DISS fitting and DISS power outlet and wall adapter. Other fitting and adapter configurations are available.	15491
M0765	Regulator, Vacuum	1	W	An air/oxygen mixer is designed to accurately control a pressurized gas mixing with an oxygen concentration. Unit contains audible alarms to warn of supply failure, an auxiliary outlet and a oxygen concentration control adjustment range from 21% to 100%. The unit can also be used to supply an accurate pre-mixed gas source to respiration or ventilator units. A specific application may require an additional air inlet filter/water trap.	15491
M3072	Frame, Infectious Waste Bag w/Lid	1	W	Frame for an infectious waste collection bag. Made of heavy tubular stainless steel with heavy gauge welded steel platform. Adjust to hold 18" or 25" trash bags. Mounted on ball bearing casters and includes permanently mounted hinged lid. Provides means of bagging infectious waste at point of waste generation.	
M4255	Stand, IV, Adjustable	1	W	Adjustable IV stand with 4-hook arrangement. Stand has stainless steel construction with heavy weight base. It adjusts from 66 inches to 100 inches and is mounted on conductive rubber, ball bearing, swivel casters. Stand is used for administering intravenous solutions.	

X1415	Laser Positioning System, Patient-Wall	1	CF	Laser positioning system. This unit is designed for accurate patient alignment for radiation therapy. Three vertical laser beams and a horizontal beam intersect to define the iso-center to aid in patient positioning. The unit is generally supplied as a component of various radiation therapy systems.	
X8501	Simulator, Therapy, X-Ray	1	CF	This system is specifically designed to simulate radiotherapy treatment plans in the Oncology Department. The characteristics and components include a precise mechanical system including digital fluoroscopic and radiographic x-ray capabilities and a flexible computer system. It shall have the capability to simulate any linear accelerator. Shall include a couch, collimator and accessories. Movements and scales shall be a match to other treatment machines to maintain their integrity of simulation for all cancer treatments. The system shall be DICOM RT compatible, for easy linkage to film-less image management systems and review stations.	

2. CONTROL AREA (XTSC1)

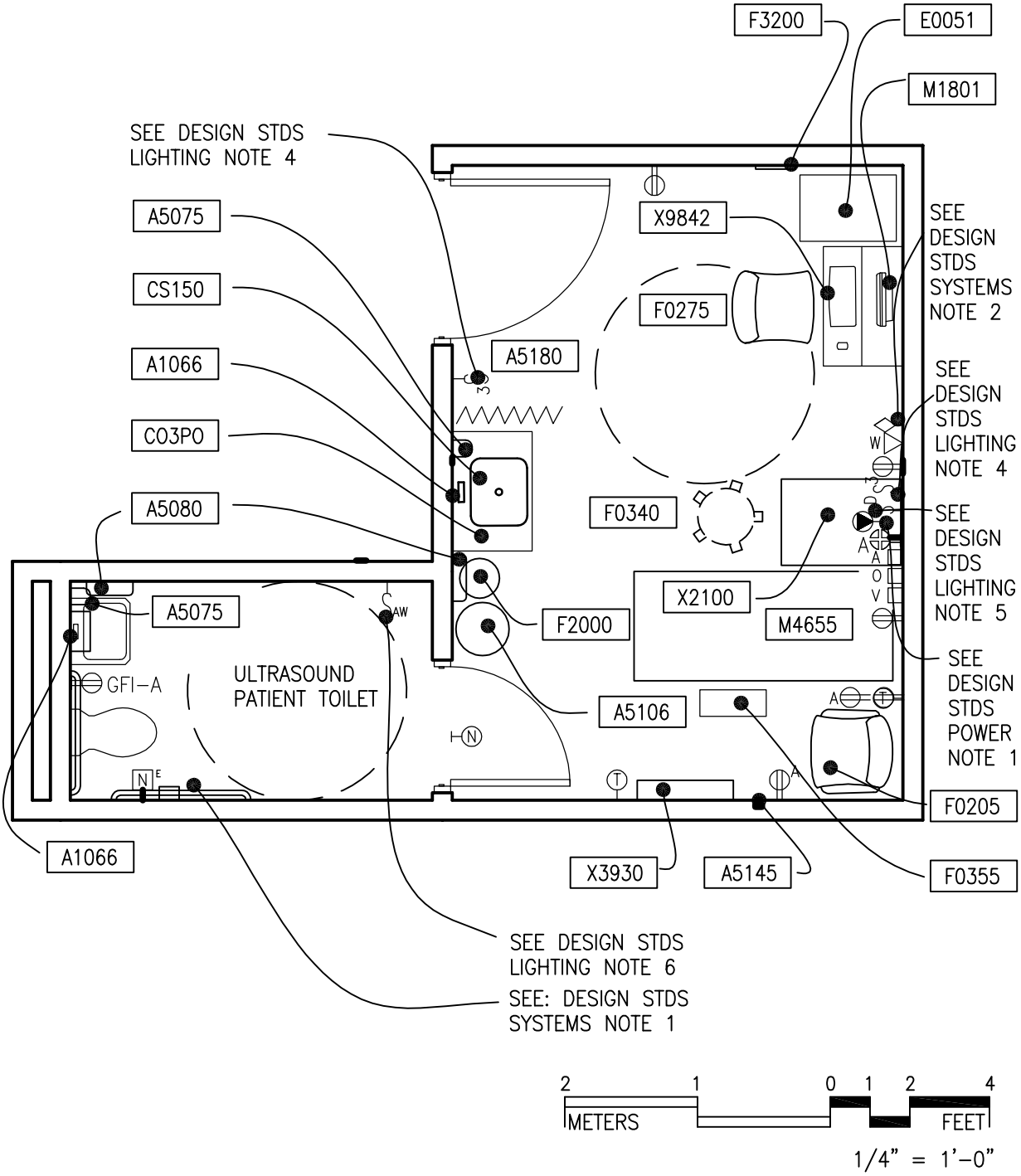
JSN	NAME	QTY	ACQ / INS	DESCRIPTION	SPEC
A1010	Telecommunication Outlet	AR	CC	Telecommunication outlet location.	27 31 00
A1015	Telephone, Desk, Multiple Line	1	CC	Telephone, desk, multiple line.	27 31 00
A5145	Hook, Garment, Double, SS, Surface Mounted	1		A surface mounted, satin finish stainless steel, double garment hook. Equipped with a concealed mounting bracket that is secured to a concealed wall plate. For general purpose use throughout the facility to hang various items of apparel.	10 28 00
C0041	Rail, Apron, 4x60x1	Only if X 8501 doesn't come with console	C	Apron rail. Also referred to as an apron front, apron panel, or knee space rail. Used to close in front knee space area and/or provide work surface support between two base cabinets or a base cabinet and wall. Apron rails should be ordered in pairs to provide both front and rear work surface support.	12 32 00

C0045	Frame, Apron, 1 Drawer, 4x36x22	Only if X 8501 doesn't come with console	CC	Apron frame with one standard drawer. Also referred to as a drawer frame or table frame. Used for a knee space as a combination frame and drawer to support a top between base cabinets or a base cabinet and a wall.	12 32 00
C06M0	Cabinet, U/C/B, 1 PBD, 2 DR, 1 File DR, 30x18x22	Only if X 8501 doesn't come with console	CC	Cabinet, U/C/B, 1 PBD, 2 DR, 1 File DR, 30x18x22	12 32 00
CT030	Countertop, High Pressure Laminate	Only if X 8501 doesn't come with console	CC	High pressure laminate countertop (composition of wood particle core with plastic laminate surface) having a hard smooth surface finish, standard thickness of 1", and a 4" butt backsplash/curb. Also referred to as a work surface or work top. Available in a wide choice of colors, patterns, and depths. Used in general purpose areas requiring a basic work surface arrangement with limited heat resistance and poor chemical resistance. Pricing based upon a 24" depth.	12 36 00
F0275	Chair, Swivel, High Back	2	W	Highback contemporary swivel chair, 41" high X 23" wide X 23" deep with five (5) caster swivel base and arms. Chair may be used at desks or in conference rooms. Back and seat are foam padded and upholstered with either woven textile fabric or vinyl.	
F2000	Basket, Wastepaper, Round, Metal	1	W	Round wastepaper basket, approximately 18" high X 16" diameter. This metal unit is used to collect and temporarily store small quantities of paper refuse in patient rooms, administrative areas and nursing stations.	
F3200	Clock, Battery, 12" Diameter	1	W	Clock, 12" diameter. Round surface, easy to read numbers with sweep second hand. Wall mounted unit for use when impractical to install a fully synchronized clock system. Battery operated, (batteries not included).	

M1801	Computer, Microprocessing, w/Flat Panel Monitor	1	W	Desk top microprocessing computer. The unit shall consist of a central processing mini tower, flat panel monitor, keyboard, mouse and speakers. The system shall have the following minimum characteristics: a 2.8 GHz Pentium processor; 512 MB memory; 80GB hard drive; 32/48x CD-ROMDVD combo; a 3.5" floppy drive; 1.44MB network interface card; video 32 MB NVIDIA; a 15 inch flat panel color monitor. The computer is used throughout the facility to input, manipulate and retrieve information.	
M1840	Printer/Copier/Fax Combination	1	VV	Multifunctional printer, fax, scanner and copier (PFC) all-in-one machine.	
X 8501-Components of Parent Item	Components of Parent Item: CT Simulator Equipment: may include electronic station, and operator console and computer	1	W	This system is specifically designed to simulate radiotherapy treatment plans in the Oncology Department. The characteristics and components include a precise mechanical system including digital fluoroscopic and radiographic x-ray capabilities and a flexible computer system. It shall have the capability to simulate any linear accelerator. Shall include a couch, collimator and accessories. Movements and scales shall be a match to other treatment machines to maintain their integrity of simulation for all cancer treatments. The system shall be DICOM RT compatible, for easy linkage to film-less image management systems and review stations.	

Ultrasound Planning Unit Room (XDUS1) 225 NSF

Floor Plan 20.9 NSM



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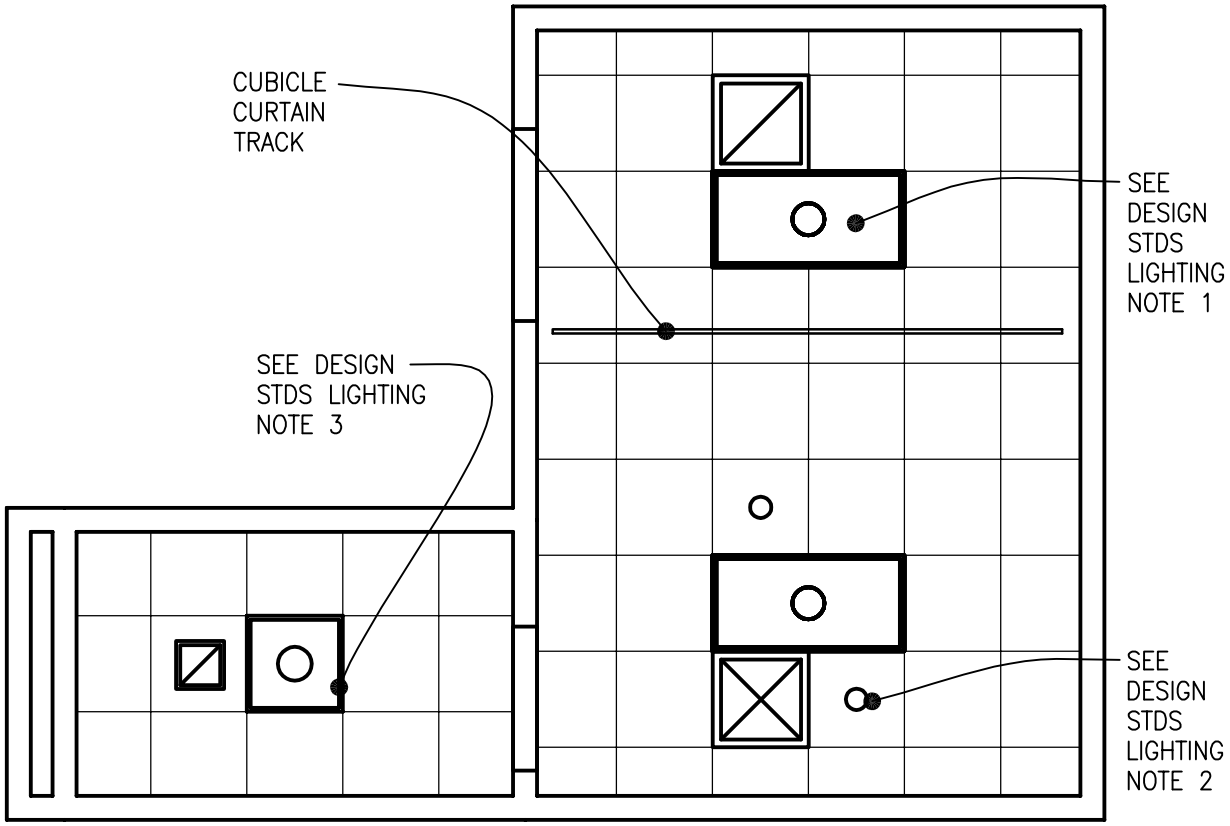
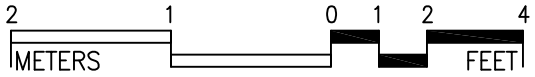
Ultrasound Planning Unit Room (XDUS1) 225 NSF

Reflected Ceiling Plan 20.9 NSM





1/4" = 1'–0"

The locations and quantities of the air outlets and inlets are tentative and may not represent the optimum design solution(s) envisioned by the designer, who shall study the layout, calculate air volumes, and may alter the arrangement shown in the reflected ceiling plan, as required, to produce a project–specific air distribution system design.

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ULTRASOUND PLANNING UNIT ROOM (XDUS1): Design Standards

ARCHITECTURAL

Ceiling:	Acoustical Tile Ceiling
Ceiling Height:	Coordinate with Equipment Manufacturer
Wall Finish:	Paint
Wainscot:	--
Base:	Vinyl
Floor Finish:	Vinyl Composition Tile
Sound Protection:	--

Notes:

1. Provide a 4'-0" wide door into the Ultrasound Planning Unit Room.

LIGHTING

Ultrasound Planning Room

General: Fluorescent lights will provide illumination level 30-40 FC during patient transfer on and from the table, equipment setting, room cleaning, and equipment maintenance.

Special: Incandescent luminaires controlled by dimmer will provide lower illumination levels down to 5 FC during scanning. Warmer light color will enhance skin appearance and patient comfort. Luminaires shall be located to avoid direct glare for patient comfort.

Toilet Room

Fluorescent light will provide illumination up to 20 FC.

Notes:

1. 2'x4' fluorescent recessed luminaire, acrylic prismatic lens, with (3) F32T8 lamps, 4100 K, CRI=85 (minimum)
2. 8-inch dia., recessed incandescent downlight, with recessed Fresnel lens, and 150W/A21 inc. horizontally mounted lamp.
3. 2'x2' fluorescent recessed luminaire, acrylic prismatic lens, with (3) F14T5 lamps, 4100 K, CRI=85 (minimum)
4. 3-way switch for fluorescent lights control, located at entrance door and at control area
5. Dimmer for incandescent downlights control
6. Occupancy sensor for automatic light control; switchbox type, wall mounted

POWER

General: The electrical power as shown is to be used as a guide only. Equipment locations, dimensions and wiring requirements should be per the ultrasound system suppliers' equipment drawings. Electrical trades should provide necessary raceways as required to allow proper connections of the ultrasound equipment and related accessories.

Notes:

1. Special receptacle to match equipment requirements.

COMMUNICATION/SPECIAL SYSTEMS

ADP:	Yes
Data:	Yes
Telephone:	Yes
Intercom:	--
Nurse Call:	Yes
Public Address:	--
Radio/Entertainment:	--
MATV:	--
CCTV:	--
MID:	--
Security/Duress:	--
VTEL:	--
VA Satellite TV:	--

Notes:

1. Nurse call in toilet room to annunciate at local reception desk and outside of the toilet room.
2. 4-port telecommunication outlet for PACS station

HEATING, VENTILATING AND AIR CONDITIONING

Inside Design Conditions:
70°F to 75°F (21°C to 24C°)
30% to 60% Relative Humidity
Minimum Air Changes Per Hour – Supply Air:
8 for Ultrasound Planning Room
100% Exhaust: Toilet Room
100% Outside Air: No
Room Air Balance:
Positive for Ultrasound Planning Room

	Negative for Toilet Room	
Dedicated Exhaust System:	No	
Occupancy:	3	
AC Load-Equipment:	3,600 Btuh to 4,800 Btuh (1,050W to 1,400W)	
AC Load-Lighting:	1.1 W/SF (12 W/M$^{2)}$ in Ultrasound Planning Room	--

Notes:

1. Verify cooling loads and other specific requirements with the equipment manufacturer on a specific project.

PLUMBING AND MEDICAL GASES	
Cold Water:	Yes
Hot Water:	Yes
Laboratory Air:	--
Laboratory Vacuum:	--
Sanitary Drain:	Yes
Reagent grade Water:	--
Medical Air:	Yes
Medical Vacuum:	Yes
Oxygen:	Yes

ULTRASOUND PLANNING UNIT ROOM (XDUS1): Equipment Guide List

JSN	NAME	QTY	ACQ / INS	DESCRIPTION	SPEC
A1010	Telecommunication Outlet	1	CC	Telecommunication outlet location.	27 31 00
A1012	Telephone, Wall Mounted, 1 Line	1	CC	Telephone, wall mounted, 1 line.	27 31 00
A1066	Mirror, Float Glass, With SS Frame, 36x18	1	CC	A high quality 1/4" polished float glass mirror 36X18, framed in a one-piece, bright polished, stainless steel channel frame with 90° mitered corners. All edges of the mirror are protected by absorbing filler strips. Mirror has a galvanized steel back with integral horizontal hanging brackets and wall hanger for concealed mounting. For mounting above single wall mounted lavatories located in toilet areas, Doctors examination offices, etc. May also be used above double lavatories, either wall or countertop mounted, found in restroom areas.	10 28 00
A5075	Dispenser, Soap, Disposable	1	W	Disposable soap dispenser. One-handed dispensing operation. Designed to accommodate disposable soap cartridge and valve.	
A5080	Dispenser, Paper Towel, SS, Surface Mounted	1	CC	A surface mounted, satin finish stainless steel, single-fold, paper towel dispenser. Dispenser features: tumbler lock; front hinged at bottom; and refill indicator slot. Minimum capacity 400 single-fold paper towels. For general purpose use throughout the facility.	10 28 00
A5106	Waste Disposal Unit, Sharps w/Glove Dispenser	1	W	The unit is designed for the disposal of sharps and complies with OSHA guidelines for the handling of sharps. It shall house a 5 quart container and be capable of being mounted on a wall. It shall have a glove dispenser attached. The unit shall be secured by a locked enclosure.	
A5145	Hook, Garment, Double, SS, Surface Mounted	1	CC	A surface mounted, satin finish stainless steel, double garment hook. Equipped with a concealed mounting bracket that is secured to a concealed wall plate. For general purpose use throughout the facility to hang various items of apparel.	10 28 00

A5180	Track, Cubicle, Surface Mounted, With Curtain	1	CC	Surface mounted cubicle track, with curtain. Track constructed of thick extruded aluminum. Equipped with self lubricating carriers, beaded drop chain hooks, and flame resistant curtain. To include removable end caps. Designed to be suspended around patient areas where privacy is needed. Price listed is per foot of the track, curtains to be priced per quote.	10 21 16
C03F0	Cabinet, U/C/B, 1 Shelf, 2 Half DR, 2 DO, 36x30x22	1	CC	Standing height under counter base cabinet with an adjustable shelf and two half width drawers above solid hinged doors. Also referred to as a combination cabinet or a drawer and cupboard cabinet. For general purpose use throughout the facility.	12 32 00
C03P0	Cabinet, Sink, U/C/B, 2 Door, 30" W	1	CC	Standing height under counter base sink cabinet. 36" H x 30" W x 22" D with two solid hinged doors. Also referred to as a double-door sink cabinet. For general purpose use throughout the facility where a sink is to be used. Coordinate actual clear cabinet dimension with the actual outside dimension of sink that is specified to ensure that they are compatible.	22 44 00
CE030	Cabinet, W/H, 2 SH, 2 GDO, Sloping Top, 38x30x13	1	CC	Wall hung cabinet with two adjustable shelves, solid hinged doors, and sloping top. Also referred to as a solid hinged double door wall case. For general purpose use throughout the facility.	22 44 00
CS150	Sink, SS, Single Compartment, 10x19x16 ID	1	CC	Single compartment stainless steel sink, drop-in, self-rimming, ledge-type, connected with a drain and provided with a mixing faucet. It shall also be provided with pre-punched fixture holes on 4" center, integral back ledge to accommodate deck-mounted fixtures, brushed/polished interior and top surfaces, and sound deadened. Recommended for use in suspended or U/C/B sink cabinets having a high plastic laminate or Chemsurf laminate countertop/work surface. Coordinate actual outside sink dimensions with the actual clear dimension of cabinet specified to ensure that they are compatible. For general purpose use throughout the facility.	22 44 00

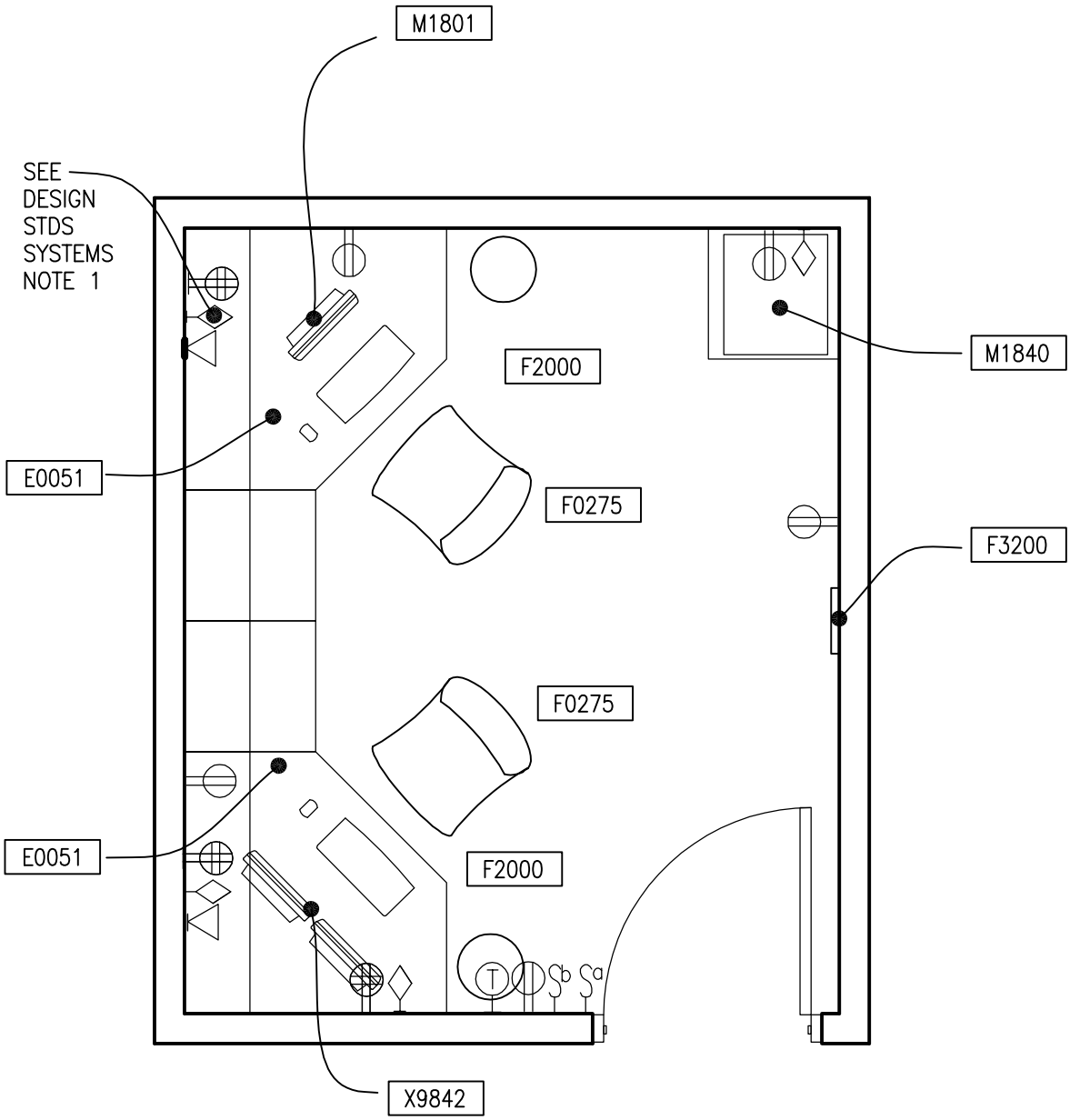
CT030	Countertop, High Pressure Laminate	5	CC	High pressure laminate countertop (composition of wood particle core with plastic laminate surface) having a hard smooth surface finish, standard thickness of 1", and a 4" butt backsplash/curb. Also referred to as a work surface or work top. Available in a wide choice of colors, patterns, and depths. Used in general purpose areas requiring a basic work surface arrangement with limited heat resistance and poor chemical resistance. Pricing based upon a 24" depth.	12 36 00
E0051	Workstation, Corner Work Surface, Wall Mtd, 72x48	2	W	THIS TYPICAL INCLUDES: 4 VERTICAL HANGING STRIPS 2 LOCKABLE FLIPPER UNITS 2 SHELF, STORAGE/DISPLAY 2 LIGHT 1 TACKBOARD 2 TOOL RAIL 2 PAPER TRAY 1 DIAGONAL TRAY 1 CANTILEVERED WORK SURFACE 1 ADJUSTABLE KEYBOARD TRAY 1 MOBILE PEDESTAL, BOX/FILE 1 CPU HOLDER	
F0205	Chair, Side With Arms	1	W	Upholstered side chair, 32" high X 21" wide X 23" deep with arms, padded seats and padded backs. Seat height is a minimum of 17". Available with or without sled base.	
F0275	Chair, Swivel, High Back	2	W	Highback contemporary swivel chair, 41" high X 23" wide X 23" deep with five (5) caster swivel base and arms. Chair may be used at desks or in conference rooms. Back and seat are foam padded and upholstered with either woven textile fabric or vinyl.	

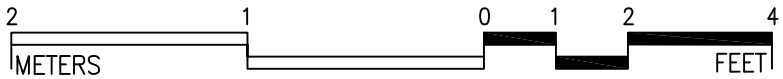
F0340	Stool, Self Adjusting	1	W	Self adjusting stool. Consists of a foam padded upholstered seat with attached foot rest for added comfort. Mounted on swivel casters. Designed for doctor's use during examinations.	
F0355	Footstool, Straight	1	W	Step stool. Used to assist patients getting on and off exam or surgical tables. Fitted with electrically conductive rubber tips.	
F2000	Basket, Wastepaper, Round, Metal	1	W	Round wastepaper basket, approximately 18" high X 16" diameter. This metal unit is used to collect and temporarily store small quantities of paper refuse in patient rooms, administrative areas and nursing stations.	
F3200	Clock, Battery, 12" Diameter	1	W	Clock, 12" diameter. Round surface, easy to read numbers with sweep second hand. Wall mounted unit for use when impractical to install a fully synchronized clock system. Battery operated, (batteries not included).	
M1801	Computer, Microprocessing, w/Flat Panel Monitor	1	W	Desk top microprocessing computer. The unit shall consist of a central processing mini tower, flat panel monitor, keyboard, mouse and speakers. The system shall have the following minimum characteristics: a 2.8 GHz Pentium processor; 512 MB memory; 80GB hard drive; 32/48x CD-ROMDVD combo; a 3.5" floppy drive; 1.44MB network interface card; video 32 MB NVIDIA; a 15 inch flat panel color monitor. The computer is used throughout the facility to input, manipulate and retrieve information.	
M4655	Stretcher, Mobile, CRS, 9 Position	1	W	Mobile stretcher. All corrosion resistant stainless steel construction. It consists of a tubular frame with side rails, a 9-position hydraulic base with pneumatic fowler adjustment, and a 2" pad. Unit is mounted on 8" conductive casters. Designed for patient transport as well as for minor surgical procedures.	

X2100	Scanner, Ultrasound, General Purpose	1	W	High definition, diagnostic ultrasound system for Radiology, Cardiology, Vascular, ob-gyn, Perinatology, and Surgical imaging applications. The unit employs curved, phased and linear array imaging technology. The system supports colorflow, pulse and continuous wave imaging modalities. On board software measurement packages available for all imaging applications. The system is DICOM 3.0 compatible, for easy linkage to filmless image management systems and review stations. In addition, a full line of probes and conventional recording devices are available.	
X3930	Illuminator, Film, Double, Wall Mounted	1	W	X-ray film illuminator approximately 20' H x 29' W x 6" D. This is a double, wall mounted type unit with a continuous viewing surface. The tension film grips are adjustable top and bottom with standard grip strip. The unit's balanced-light viewing is assured by the 32W circular fluorescent lamp. It provides 500 feet candles of cool operation across the entire 14" X 17" viewing surface. It is available with or without film-activated switch. The unit can be used in hospitals, examining rooms, satellite office or lab.	
X9842	Computer, Rad Therapy Treatment Planning	1	W	The treatment planning computer must provide a total system three dimensional configuration that provides enhanced visualization of the radiation beam target volume, patient anatomy, treatment beam data and dose distribution. The system must be capable of brachytherapy treatment planning, using both linear and seed source. As a minimum shall include the optional CT/MR interface via Ethernet, a second remote work station and graphic work station.	

Treatment Planning Computer Room/Dosimetry Room (XTTP1) 125 NSF

Floor Plan 11.6 NSM



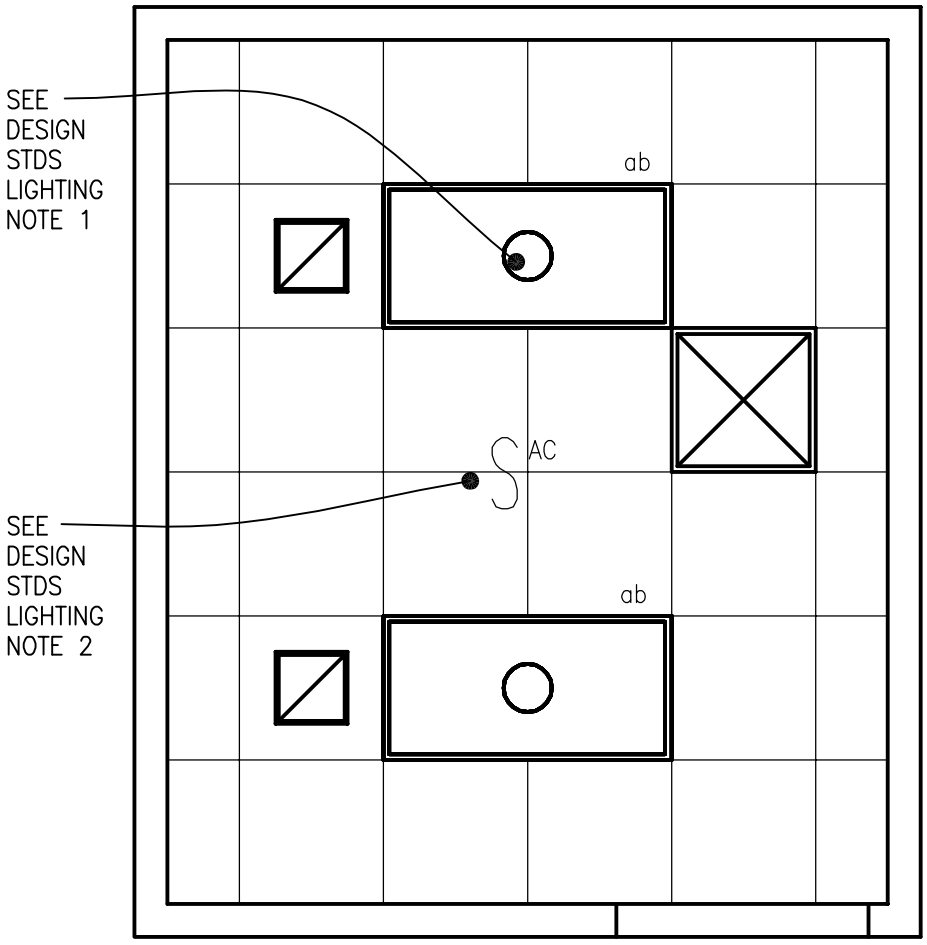


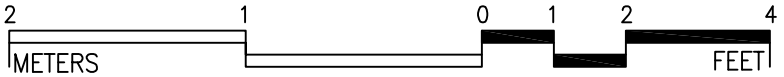
3/8" = 1'–0"

Guide plates are graphical representations of selected room types, illustrating the integration of space, components, systems, and equipment. They provide typical configurations and general technical guidance, and are not intended to be project specific. Specific infrastructure design requirements are contained in VA Design Manuals and Space Planning Criteria located in the VA Technical Information Library.

Treatment Planning Computer Room/Dosimetry Room (XTTP1) 125 NSF

Reflected Ceiling Plan 11.6 NSM





3/8" = 1'–0"

The locations and quantities of the air outlets and inlets are tentative and may not represent the optimum design solution(s) envisioned by the designer, who shall study the layout, calculate air volumes, and may alter the arrangement shown in the reflected ceiling plan, as required, to produce a project–specific air distribution system design.

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TREATMENT PLANNING COMPUTER ROOM / DOSIMETRY ROOM (XTTP1): Design Standards

ARCHITECTURAL

Ceiling:	Acoustical Tile Ceiling
Ceiling Height:	8'-0"
Wall Finish:	Paint
Wainscot:	--
Base:	Vinyl
Floor Finish:	Vinyl Composition Tile
Sound Protection:	--

LIGHTING

General: Fluorescent lights provide illumination level up to 30 FC.

Special: Luminaires are dual switched with step dimming ballasts for multi-level illumination

Notes:

1. 2'x4' fluorescent recessed direct/indirect luminaire, perforated metal shield with overlay, with (2) F28T5 lamps, 4100 K, CRI=85 (minimum).
2. Occupancy sensor for automatic light control, ceiling mounted.

POWER

Notes:

1. Emergency power and local UPS unit to be provided as required by hospital.

COMMUNICATION/SPECIAL SYSTEMS

ADP:	Yes
Data:	Yes
Telephone:	Yes
Intercom:	--
Nurse Call:	--
Public Address:	--
Radio/Entertainment:	--
MATV:	--
CCTV:	--
MID:	--
Security/Duress:	--
VTEL:	--
VA Satellite TV:	--

Notes:

1. PACS: two 4-port communication outlets per PACS station.

HEATING, VENTILATING AND AIR CONDITIONING

Inside Design Conditions:
70° to 75°F (21°C to 24°C)
30% to 60% Relative Humidity

Minimum Air Changes per Hour – Supply Air:	6
100% Exhaust:	No
100% Outside Air:	No
Room Air Balance:	Positive
Dedicated Exhaust System:	No
Occupancy:	3
AC Load-Equipment:	3500 Btuh (1000 W)
AC Load-Lighting:	1.9 W/SF (20 W/M²)

Notes:

1. Verify cooling loads and other specific requirements with the equipment manufacturer on a specific project.

PLUMBING AND MEDICAL GASES

Cold Water:	--
Hot Water:	--
Laboratory Air:	--
Laboratory Vacuum:	--
Sanitary Drain:	--
Reagent grade Water:	--
Medical Air:	--
Medical Vacuum:	--
Oxygen:	--

TREATMENT PLANNING COMPUTER ROOM / DOSIMETRY ROOM (XTTP1):
Equipment Guide List

JSN	NAME	QTY	ACQ / INS	DESCRIPTION	SPEC
A1010	Telecommunication Outlet	1	CC	Telecommunication outlet location.	27 31 00
A1015	Telephone, Desk, Multiple Line	1	CC	Telephone, desk, multiple line.	27 31 00
A5145	Hook, Garment, Double, SS, Surface Mounted	1	CC	A surface mounted, satin finish stainless steel, double garment hook. Equipped with a concealed mounting bracket that is secured to a concealed wall plate. For general purpose use throughout the facility to hang various items of apparel.	10 28 00
E0051	Workstation, Corner Work Surface, Wall Mtd, 72x48	2	W	THIS TYPICALLYINCLUDES: 4 VERTICAL HANGING STRIPS 2 LOCKABLE FLIPPER UNITS 2 SHELF, STORAGE/DISPLAY 2 LIGHT 1 TACKBOARD 2 TOOL RAIL 2 PAPER TRAY 1 DIAGONAL TRAY 1 CANTILEVERED WORK SURFACE 1 ADJUSTABLE KEYBOARD TRAY 1 MOBILE PEDESTAL, BOX/FILE 1 CPU HOLDER	
F0275	Chair, Swivel, High Back	2	W	Highback contemporary swivel chair, 41" high X 23" wide X 23" deep with five (5) caster swivel base and arms. Chair may be used at desks or in conference rooms. Back and seat are foam padded and upholstered with either woven textile fabric or vinyl.	

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M1840	Printer/Copier/Fax Combination	1	W	Multifunctional printer, fax, scanner and copier (PFC) all-in-one machine.	