

ATTACHMENT 2

**Excerpts from February 2006 Utah Division of Water Rights
Water Well Database**

**UTAH DIVISION OF WATER RIGHTS****WELLVIEW Well Information Program**

Version: 2005.03.01.00 Rundate: 02/13/2006 10:14 AM

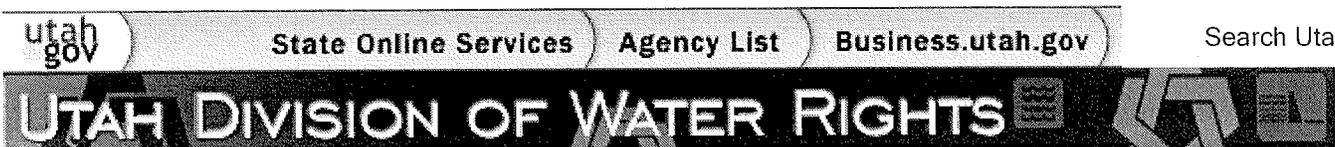
Well Logs for section 01 township 6N range 2W SL b&m

STR Logs

Quit

WRNUM/Appl. No.	Diameter	Depth	Location(link to Log)	Geologic Log
<u>35-5011</u>			<u>S2406 E3612 NW 01 6N 2W SL</u>	
<u>35-2059</u>	12.0	1002.0	<u>S2406 E3612 NW 01 6N 2W SL</u>	
<u>35-1320</u>	12.0	1002.0	<u>S2406 E3612 NW 01 6N 2W SL</u>	
<u>35-710</u>	2.0	720.0	<u>S945 E722 NW 01 6N 2W SL</u>	
<u>35-308</u>	2.0	639.0	<u>N669 W511 E4 01 6N 2W SL</u>	
<u>35-180</u>	2.0	617.0	<u>S125 E2075 NW 01 6N 2W SL</u>	

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WELLPRT Well Log Information Listing

Version: 2003.09.18.00 Rundate: 10/12/2003 09:51 AM

Utah Division of Water Rights

Water Well Log

LOCATION:

N 669 ft W 511 ft from E4 CORNER of SECTION 1 T 6N R 2W BASE SL

DRILLER ACTIVITIES:

ACTIVITY # 1 NEW WELL
 START DATE: 10/24/1945 COMPLETION DATE: 10/28/1945

BOREHOLE INFORMATION:

Depth(ft)		Diameter(in)	Drilling Method	Drilling Fluid
From	To			
0	639	2		

LITHOLOGY:

Depth(ft)		Lithologic Description
From	To	
0	95	CLAY
95	110	SAND
110	128	CLAY
128	142	SAND
142	148	CLAY
148	152	SAND
152	167	CLAY
167	173	GRAVEL
173	251	OTHER
251	263	SAND
263	338	OTHER
338	350	SAND
350	357	CLAY
357	383	SAND
383	454	CLAY
454	467	SAND
467	517	CLAY
517	578	OTHER
578	610	OTHER
610	615	SAND
615	631	CLAY
631	639	GRAVEL

CONSTRUCTION - CASING:

Depth (ft)	Material	Gage (in)	Diameter (in)
From To			
0 639	BLACK STEEL		2

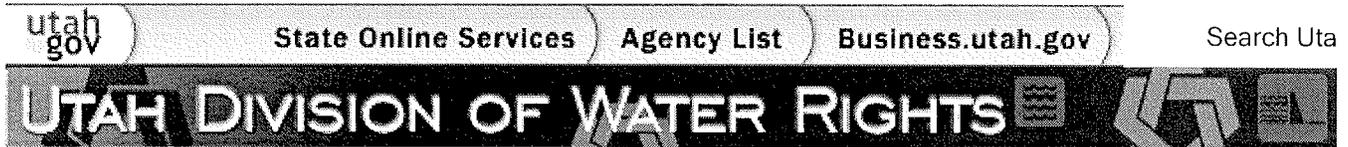
CONSTRUCTION - SCREENS/PERFORATIONS:

Depth (ft)	Screen (S) or Perforation (P)	Slot/Perf. siz	Screen Diam/Le
From To			
0 625	PERFORATION		

WELL TESTS:

Date	Test Method	Yield (CFS)	Drawdown (ft)	Time Pumped (hr)
10/28/1945	FLOWING	.033		

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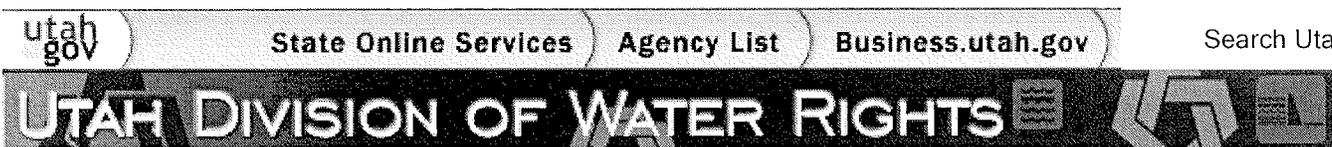
WELLVIEW Well Information Program

Version: 2005.03.01.00 Rundate: 02/13/2006 10:16 AM

Well Logs for section 06 township 6N range 1W SL b&m

WRNUM/Appl. No.	Diameter	Depth	Location(link to Log)	Geologic Log
35-840	16.0	1301.0	S641 E1433 N4 06 6N 1W SL	
35-1963	3.0	704.0	N1422 W2375 SE 06 6N 1W SL	
35-4287	8.0	764.0	S2273 E362 NW 06 6N 1W SL	
35-4534	8.0	764.0	S2273 E362 NW 06 6N 1W SL	
a24881	16.0	1301.0	S641 E1433 N4 06 6N 1W SL	

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WELLVIEW Well Information Program

Version: 2005.03.01.00 Rundate: 02/13/2006 10:41 AM

Well Logs for section 12 township 6N range 2W SL b&m

WRNUM/ Appl. No.	Diameter	Depth	Location (link to Log)	Geologic Log
<u>35-5254</u>	2.0	315.0	<u>S995 W796 N4 12 6N 2W SL</u>	

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UTAH DIVISION OF WATER RIGHTS

WELLVIEW Well Information Program

Version: 2005.03.01.00 Rundate: 02/13/2006 10:39 AM

Well Logs for section 07 township 6N range 1W SL b&m

WRNUM/Appl. No.	Diameter	Depth	Location(link to log)	Geologic Log
<u>9435012M00</u>	4.0	130.0	<u>N3500 E490 SW 07 6N 1W SL</u>	
<u>9035003M00</u>	0.0	0.0	<u>N3500 E500 SW 07 6N 1W SL</u>	

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ATTACHMENT 3

Excerpts from JBR's December 1998 *Soil Investigation Report*

(Former Wash Rack Areas)

SOIL INVESTIGATION REPORT
Vehicle Maintenance Shop
Browning USARC Facility, Ogden, Utah

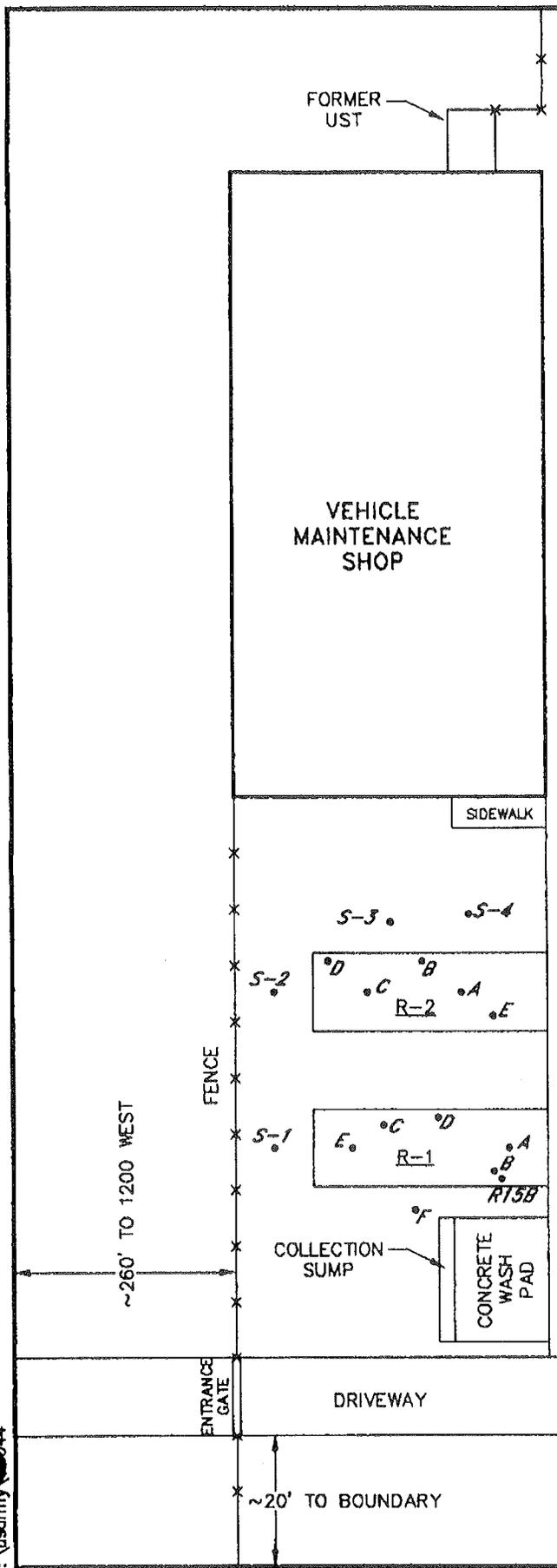
Prepared for:

Fort Douglas Army Reserve
HQ, 96th Regional Support Command
Salt Lake City, Utah 84113-5007

Prepared by:

JBR Environmental Consultants, Inc.
8160 South Highland Drive
Sandy, Utah 84093

December 15, 1998



PAVED PARKING AREA

EXPLANATION

• A SAMPLE LOCATION

**BROWNING US ARMY RESERVE
FORT DOUGLAS**

**FIGURE 1
SITE MAP AND SAMPLE LOCATIONS**

jbr environmental consultants, inc. <small>Burr Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada</small>			DATE DRAWN 10/25/88
DESIGN BY CD	DRAWN BY CP	CH'D BY	SCALE 1" = 20'
REVISION			REVISOR

f:\usarmy\0644

EXECUTIVE SUMMARY

A limited release of grease and oil to near-surface soils has occurred in a vehicle maintenance area located in the rear of the Browning U. S. Army Reserve Center (USARC) located in Ogden, Utah (Figure 1). The petroleum hydrocarbon concentrations reported for the soil samples collected ranged up to 2,770 ppm for surface samples and up to 163 ppm for subsurface samples at a depth of four feet (oil and grease, Method 413.1). These concentrations are well below the Risk-Based Corrective Action (RBCA) Tier 1 Screening Levels applied to underground storage tank (UST) sites (10,000 ppm oil and grease for soil). Ground water was previously observed to occur at a depth of 9 to 15 feet at a nearby location. The soils underlying the site are dense clays (CH). As a result of this information and other site sensitivity information given below, this site is recommended for closure under the RBCA guidelines which may be applied to such non-UST sites.

1.0 INTRODUCTION

The U. S. Browning Army Reserve Center (USARC) is located at 1380 North 1200 West in Ogden, Utah and is a facility used for vehicle preparedness/maintenance and various command and training activities. The vehicle maintenance work required the installation and operation of grease racks for routine vehicle maintenance.

In approximately 1978, the USARC constructed the grease racks within an area designated for lube and oil maintenance of army vehicles. The racks were placed on a dirt/gravel area and used for approximately 10-12 years. The lube and oil facility was decommissioned and in 1997 the grease racks were removed. On June 30, 1998 JBR perform a surface investigation of this area to determine the extent, if any, of TPH contamination.

Previously, a limited release of oil and grease was reported from a 500-gallon used oil underground storage tank (UST) in October 1996 (UST Site Number 1200341, Release Site Number EJUD). The UST site was located approximately 170 feet north of the grease rack site. A small volume of stained soils was observed immediately around the vertical UST fill pipe. Also, the laboratory results of samples collected during the tank removal showed oil and grease concentrations of 50.2 and 198 mg/kg in soil and 62 mg/l in ground water. The elevated concentrations reported in the ground water warranted a follow-up investigation to determine the extent of contamination. The results of that follow-up investigation were reported to the Division of Environmental Response and Remediation (DERR) in a report entitled *Leaking Underground Storage Tank Subsurface Investigation Report, Browning USARC Facility, Ogden, Utah, Release Site Number EJUD, March 24, 1997*. That project concluded with a risk-based closure of the UST site without any remedial action.

2.0 SITE DESCRIPTION AND MAPS

The vehicle maintenance building and office building are located in the northwest corner of the property on a hill that is approximately ten feet higher in elevation than the remaining property to the south and east. The land surface slopes to the south at the former lube site which included the grease racks. Based on this information, the shallow unconfined ground water beneath the site is assumed to flow south in the immediate vicinity of the former lube site (see Figure 1).

3.0 ENVIRONMENTAL SENSITIVITY

The vehicle maintenance shop occupies the northwest corner of a large military reservation (Defense Depot Ogden) with restricted public access. Fences surround the property in all directions. Based on the slope of the topography, shallow unconfined ground water is interpreted to flow south. The vehicle maintenance facility is bounded on the east and south by vacant lands part of the Reserve Center (extending approximately 0.5 miles east and 1.0 miles south), to the north by former barracks

that have been converted to residential use, and to the west by 1200 West Street. The residences to the north are approximately 350 feet from the former lube site. The former lube site is also about 300 feet east of 1200 West Street.

The buried utilities closest to the lube site include a east-west trending water line and sewer that connect the administration building to the west with the vehicle maintenance building (see Figure 1). These lines enter the vehicle maintenance building on the southwest corner of the building which is approximately 50 feet northwest of the lube site in an up-gradient direction. Buried utilities are also likely present along the east-west road located approximately 350 feet north (up-gradient) of the lube site.

4.0 NATURE OF THE RELEASE AND ABATEMENT MEASURES

The results of the soil investigation show that a limited release of grease and oil has occurred in the area resulting from routine vehicle maintenance activities. These results also suggest that the hydrocarbon-impacted soils are restricted to near-surface soils. No abatement measures were performed based on the lack of evidence that a significant release had occurred.

5.0 SAMPLING METHODS AND RESULTS

5.1 Phase I Soil Sampling

On June 30, 1998, JBR collected 11 surface soil samples within the area from which the grease racks were removed (Figure 1). These samples were collected by use of a clean disposable trowel and immediately placed in a cooler on ice. Sample jars and bottles were provided by the laboratory specifically for the sampling and analysis requested. The samples were submitted to Enviro Pro Laboratories for oil and grease analysis (Method 413.1) under chain-of-custody procedures. After completion of the 413.1 analysis, the laboratory was instructed to composite the 11 samples and perform Toxicity Characteristic Leaching Procedure (TCLP) metals analysis on the composited sample. This latter test would determine if the soil exhibited hazardous characteristics based on Resource Conservation and Recovery Act (RCRA) criteria for metals.

The analytical results are summarized in Table 1. Laboratory reports are given in Appendix A. The analytical results for these surface samples indicated oil and grease concentrations within the grease rack area ranging from 493 parts per million (ppm) to 2,770 ppm with low TCLP metals concentrations indicating that the soils do not have hazardous characteristics based on RCRA metals criteria. JBR recommended further sampling of the area to further investigate the extent of the hydrocarbon-impacted soil.

Table 1: Phase I Surface Soil Results

Sample Identification	Oil & Grease (413.1, ppm)	TCLP Metals (ppm)	
R1-A	1,303		
R1-B	2,770		
R1-C	1,843	Arsenic	<0.1
R1-D	1,847	Barium	1.27
R1-E	1,250	Cadmium	<0.02
R1-F	493	Chromium	<0.05
R2-A	910	Lead	<0.05
R2-B	1,553	Mercury	<0.05
R2-C	1,080	Selenium	<0.01
R2-D	943	Silver	<0.05
R2-E	1,800		

5.2 Phase II Soil Sampling

On July 20, 1998, JBR conducted a follow-up soil sampling investigation of the grease rack areas. Four surface samples were collected at the perimeter of the known grease rack areas to determine the horizontal extent of contamination (sample numbers S-1 thru S-4). Subsurface samples were collected at the same locations as the previous Phase I surface samples (Figure 1). Within Grease Rack Area 1, samples were collected at a depth range of three to ten feet below surface level. In Grease Rack Area 2, samples were collected at a depth range of four to eight feet.

Samples were collected by use of a direct-push hydraulic probe. Samples consisted of a composite of a two foot core taken by the hydraulic probe. Samples depths and locations were recorded. Samples were placed in a cooler on ice and chain-of-custody procedures were followed. Sample jars and bottles were provided by the laboratory specifically for the sampling and analysis requested. Analytical results are summarized in Table 2 and laboratory reports are included in Appendix A. In Table 2, "R15-B" refers to (grease) Rack #1, a sample depth of 5 to 7 feet, and surface sample Site B. Samples collected from depths below samples showing relatively low concentrations of hydrocarbons were not analyzed. JBR observed that clay-like soils existed approximately three to

four feet below the surface level and extended beyond the depth of ten feet. This is consistent with the soil analysis performed on the Unified Soil Classification sample collected from a depth of nine feet at the former UST site. That sample was determined to be a CH soil containing fat clay of high plasticity. The results of the UST-related investigation also showed that groundwater occurred 9-15 feet below the land surface.

Table 2: Phase II Subsurface and Surface Soil Results

Sample Identification	Subsurface or Surface Sample	Oil & Grease (413.1, ppm)
R15-A	Subsurface	10
R15-B	Subsurface	33
R18-B	Subsurface	Not Analyzed
R13-C	Subsurface	40
R15-C	Subsurface	Not Analyzed
R14-D	Subsurface	33
R15-E	Subsurface	73
S-1	Surface	110
S-2	Surface	50
S-3	Surface	40
S-4	Surface	247
R24-A	Subsurface	123
R24-B	Subsurface	163
R26-B	Subsurface	Not Analyzed
R24-C	Subsurface	160
R24-D	Subsurface	133
R24-E	Subsurface	110
R26-E	Subsurface	Not Analyzed

6.0 CONCLUSIONS

The maximum concentration of hydrocarbons reported for the impacted soil in the area of the former grease racks was 2,770 ppm oil and grease. Results of follow-up sampling showed lower concentrations of hydrocarbons which ranged up to a concentration of 163 ppm oil and grease at a depth of four feet. These results suggest that the hydrocarbon concentrations reported for the surface soils diminished with depth. These reported concentrations are well below the DERR's Risk-Based Corrective Action Tier 1 Screening Level typically applied to UST sites (10,000 ppm for oil and grease in soil).

The results of the investigation are consistent with relatively small spills of grease and, perhaps, used oil during the routine vehicle maintenance activities performed in the area of the grease racks. Based on the available information, the apparently very low hydraulic conductivity of the underlying clays, and the actual use of the property as a military reservation with restricted public access, there appears to be little potential for this release to pose a significant health hazard.

7.0 RECOMMENDATIONS

Based on the available information, it appears that no further action is warranted and it is recommended that the site be considered for closure under the Risk-Based Corrective Action (RBCA) guidelines which may be applied to this non-UST site. The information given below is intended to aid the supervising agency personnel in evaluating the site for closure.

8.0 SUMMARY OF SITE CONDITIONS FOR RBCA SCREENING PURPOSES

8.1 RCL-Related Information

Distance from contamination to ground water:	5-10 feet.
Soil type:	Dense clays (CH) throughout soil profile.
Annual precipitation (Ogden):	20.62 inches.
Nearest municipal well:	Approx. 1,000 feet NNE of the site; depth of 795 feet; owned by Harrisville Heights, Inc.
Nearest other well:	Approx. 600 feet NW of the site; depth of 512 feet; owned by W. Medell; irrigation and domestic use.

ATTACHMENT 4

**Excerpts from JBR's March 1997
*LUST Subsurface Investigation Report***

(Former Used Oil LUST Area)

**LEAKING UNDERGROUND STORAGE TANK
SUBSURFACE INVESTIGATION REPORT
Browning USARC Facility, Ogden, Utah
Release Site Number EJUD**

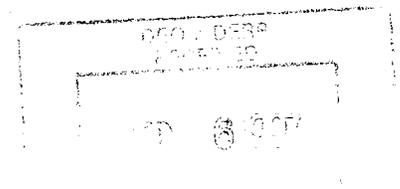
Prepared for:

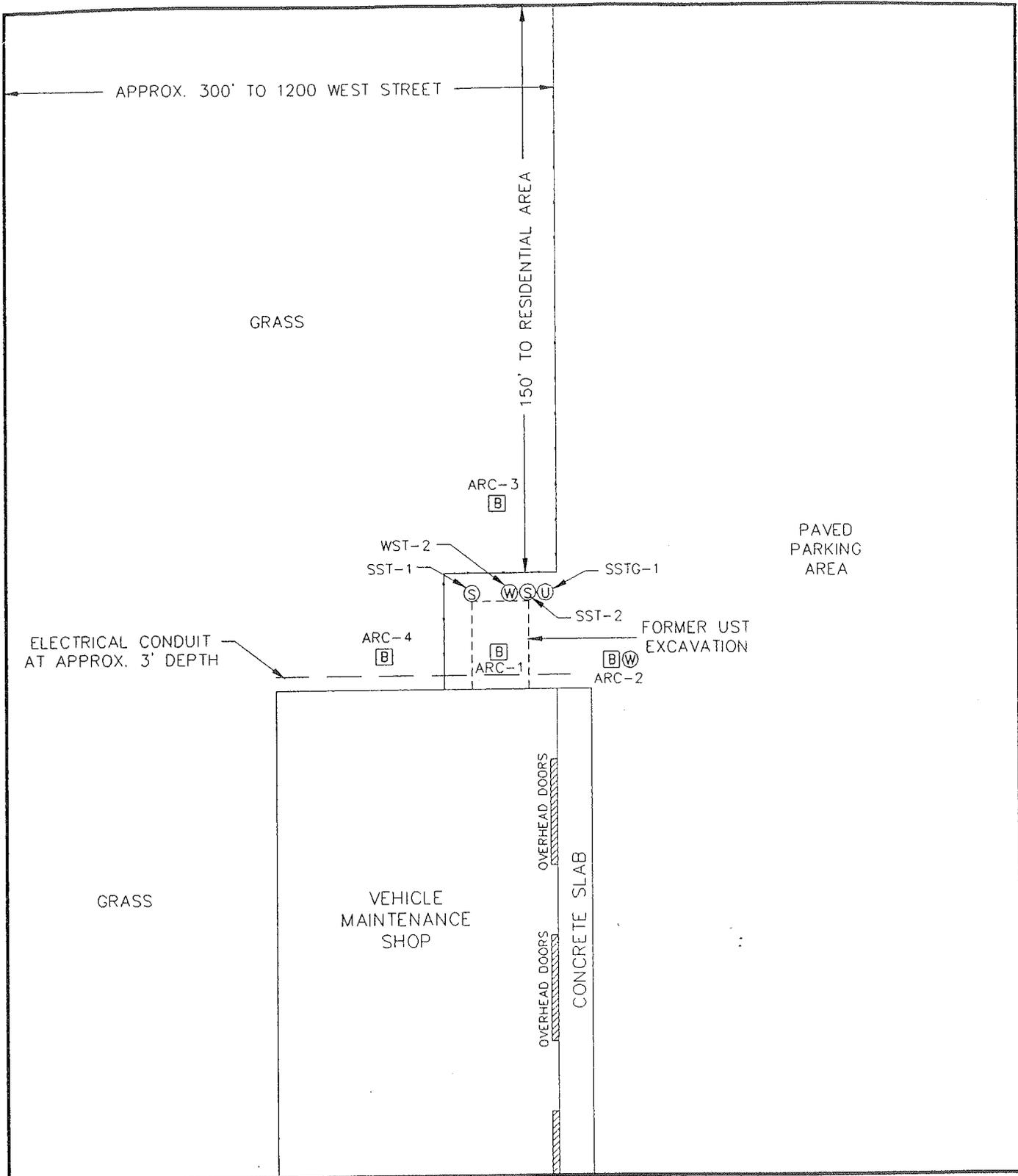
Fort Douglas Army Reserve
HQ, 96th Regional Support Command
Salt Lake City, Utah 84113-5007

Prepared by:

JBR Environmental Consultants, Inc.
8160 South Highland Drive
Sandy, Utah 84093

March 24, 1997





EXPLANATION

- Ⓢ SOIL SAMPLE
- Ⓜ GROUNDWATER SAMPLE
- Ⓤ USC SAMPLE
- [B] SOIL BORING

SAMPLE DEPTHS

- SST-1 9 FEET
- SST-2 9 FEET
- SSTG-1 9 FEET
- WST-2 9 FEET
- ARC-2 10-15 FEET

20 0 20 FEET



BROWNING ARMY RESERVE CENTER

1380 NORTH 1200 WEST - OGDEN, UTAH

FIGURE 1
SITE MAP



environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY AM DRAWN BY CP CH'D BY SCALE 1"=20'

DATE DRAWN 3/21/97

REVISION

ANUSI-21

EXECUTIVE SUMMARY

A limited release of oil and grease was reported from a 500-gallon waste oil UST in October 1996. A small volume of stained soils was observed immediately around the vertical fill pipe. Also, the laboratory results of samples collected during the tank removal showed oil and grease concentrations of 50.2 and 198 mg/kg in soil and 62 mg/l in ground water. The elevated concentrations reported in the ground water warranted a follow-up investigation to determine the extent of contamination.

On February 19, 1997, a limited subsurface investigation was performed in an attempt to sample the ground water previously sampled in the UST excavation and in nearby surrounding areas. Four soil borings were driven with the aid of a hydraulic drive-point sampler. The boring placed in the middle of the former tank pit met refusal at a depth of nine feet where a concrete pad was encountered. Three other borings were placed ten feet away to the east, north, and west of the former tank site. The adjacent building to the south prevented boring in this area. The results of the soil boring showed that the subsurface soils are relatively homogeneous dense clays with expected low hydraulic conductivity. Because of the very slow water level recovery in the shallow unconfined aquifer beneath the site, only one partial water sample was obtained from the borings. This water sample was collected after water was allowed to seep into the hole for 3.5 hours. The sample was collected from the boring located ten feet east of the former tank site and was reported to contain <25 mg/l oil and grease.

No new evidence of contamination of soil or ground water resulted from this additional investigation. The existing evidence of contamination is consistent with small spills during filling procedures. In addition, the occurrence of extensive, dense clays appears to have restricted the migration of the release.

Based on this information, it appears that no further work is warranted and it is recommended that the site be considered for closure under the Risk-Based Corrective Action guidelines.

1.0 INTRODUCTION

The Browning Army Reserve Center is located at 1380 North 1200 West in Ogden, Utah and is a facility used for vehicle preparedness/maintenance and various command and training activities. The vehicle maintenance work required the operation of a 500-gallon underground storage tank (UST) on the premises to temporarily store waste oil. The Facility ID# for the site is 1200341. The tank had reportedly been used for a period of about 12 years through 1995. The UST was removed on September 30 and October 1, 1996 under the supervision of the Utah Department of Environmental Response and Remediation (DERR) and the Weber-Morgan District Health Department. The double-walled tank and vertical fill pipe appeared to be in good condition with no evidence of release through the tank wall or pipe. However, some discolored ground was observed around the fill pipe. The UST closure-related samples were collected immediately beneath the UST along the edges of the concrete anchor-slab at a depth of nine feet and included soil and ground water samples and a USC sample. The results of that sampling showed no measurable analytes as a result of analysis of the ground water sample (WST-1) and the two soil samples (SST-1 and 2) by Methods 8015 Modified (total petroleum hydrocarbons), 8020 (benzene, toluene, ethylbenzene, xylenes, and naphthalene), and 8010 (purgeable halocarbons). However, the analyses performed on the samples for total recoverable oil and grease detected the following concentrations:

Ground Water Sample WST-1:	< 100 mg/l (62 mg/l)
Soil Sample SST-1:	198 mg/kg
Soil Sample SST-2:	50.2 mg/kg.

Apparently, only a small volume of ground water was able to be sampled at the time of tank removal which resulted in the elevated detection limit of 100 mg/l. The DERR contacted the laboratory in this matter and the laboratory personnel re-interpreted the analytical result to report a concentration of 62 mg/l oil and grease in the ground water sample. The USC sample (SSTG-1) was also collected from a depth of nine feet and was determined to be a CH soil containing fat clay of high plasticity.

The Closure Notice was submitted to the DERR on November 18, 1996. Based on this information, the DERR issued a letter on December 20, 1996 informing the Facilities Manager at the Browning Army Reserve Center that the site had been added to the leaking UST (LUST) list (Release Site EJUD) and further site investigation was warranted. The reported 62 mg/l oil and grease reported in the ground water sample was of particular concern. Additional site investigation was performed on February 19, 1997 using hydraulic drive point (HDP, or "geoprobe") equipment to collect additional soil and ground water samples. As a result of this additional work completed in February 1997, no other work is recommended and the site is recommended for closure.

6.0 RESULTS

The results of the field investigation did not identify any additional contamination at this LUST site. Boring ARC-1 was drilled in the middle of the former tank pit and encountered a concrete slab at a depth of nine feet. This slab was likely the "anchor slab" originally installed with the UST. Upon removal, the tip of the drive point was observed to be wet. ARC-2 was set to a depth of 15 feet and initially encountered no ground water. ARC-3 and 4 were set to depths of 20 and 18 feet, respectively, and encountered no ground water. Only after approximately 3.5 hours did the sufficient water flow into ARC-2 to allow the collection of a partial sample of water (approximately 20% of the liter requested by the laboratory). Ground water did not flow into any of the other wells to the extent that any sample could be collected. Soil boring logs are shown in Appendix A.

The soil cores examined were all virtually identical in appearance. As a result, the subsurface sediments between the depths of 5 and 11 are interpreted to be relatively homogeneous medium brown, dense clay (CH). In addition, the driller observed that the sediments that were encountered to a depth of 20 feet in ARC-3 were likely the same clay material. These results are consistent with the results of the analysis of the USC sample collected during tank removal which identified a CH clay of high plasticity at a depth of nine feet.

This information suggests that the UST was installed in dense clay sediments with very low hydraulic conductivity. As a result, the "ground water" observed at a depth of nine feet in ARC-1 may be water that has infiltrated the UST excavation that was backfilled with coarse gravel to the surface. Consequently, the ARC-1 ground water may be confined to gravel in a clay "bath tub" and may be unrepresentative of the actual water table. Because water entered the ARC-2 boring that was open to 15 feet, it is likely that the water table occurs above a depth of 15 feet. This information suggests that the water table occurs between the depths of 9 and 15 feet below the ground surface.

The analysis of the partial ground water sample from ARC-2 showed no measurable oil and grease (EPA Method 1664). For that reason, and because no other evidence of contamination was observed during the soil borings, none of the soil samples were analyzed. The small volume of ground water collected from ARC-2 only allowed a detection limit of 25 mg/l oil and grease. The laboratory report is shown in Appendix B. There were no drill cuttings or purge water generated from this investigation.

7.0 CONCLUSIONS

No additional evidence of contamination of soil or ground water was identified as a result of this follow-up investigation. No impacts to soil were observed at the sampling points located

ten feet north, east, and west of the former tank. The small volume of ground water that could be obtained from the east sample point contained <25 mg/l oil and grease. The sample volume collected was less than that required by the laboratory to allow the desired detection limit of 10 mg/l which is the regulatory limit for the Risk-Based Corrective Action Tier 1 Screening Level. Therefore, it is possible that concentrations of oil and grease in the ground water were between 10 and 25 mg/l.

The only conclusive evidence of the release was the limited soil staining around the fill pipe and the samples collected during tank removal. The concentrations of oil and grease reported in the soil samples were relatively low at 50.2 and 198 mg/kg. The concentration reported in the ground water sample collected during the tank removal was 62 mg/l.

The results of the investigation are consistent with relatively small spills of waste oil during the pouring of waste oil into the vertical fill pipe leading to the (former) UST below. The spilled waste oil likely flowed through the fill around the tank and collected in the bottom of the tank pit. The floor and walls of the tank pit appear to be composed of dense fat clays (CH) of high plasticity and low hydraulic conductivity.

Based on this information, the apparently very low hydraulic conductivity of the surrounding clays, and the actual use of the property as a military reservation with restricted public access, there appears to be little potential for this release to pose a significant health hazard.

8.0 RECOMMENDATIONS

Based on the available information, it appears that no further action is warranted and it is recommended that the site be considered for closure under the Risk-Based Corrective Action (RBCA) guidelines.

9.0 SUMMARY OF SITE CONDITIONS FOR RBCA SCREENING PURPOSES

9.1 RCL-Related Information

Distance from contamination to ground water:	Ground water is impacted.
Soil type:	Dense clays (CH) throughout soil profile.
Annual precipitation (Ogden):	20.62 inches.

ATTACHMENT 5

Excerpts from Various US EPA and Other Regulatory Sources of Information Pertinent to the Ogden Defense Depot (ODD) Superfund NPL Site



FIGURE 5. Waste Disposal Areas, Operable Unit 4

U.S. ARMY



**MATERIEL
COMMAND**

RECEIVED

NOV - 9 2005

DEQ
Environmental Response & Remediation

FINAL

**SEMI-ANNUAL OPERATIONS REPORT
SECOND HALF, TENTH YEAR
Operable Unit 4 and Operable Unit 4 Hotspot
Groundwater Treatment Systems
Defense Distribution Depot Hill
Ogden, Utah**

November 2005

prepared for:

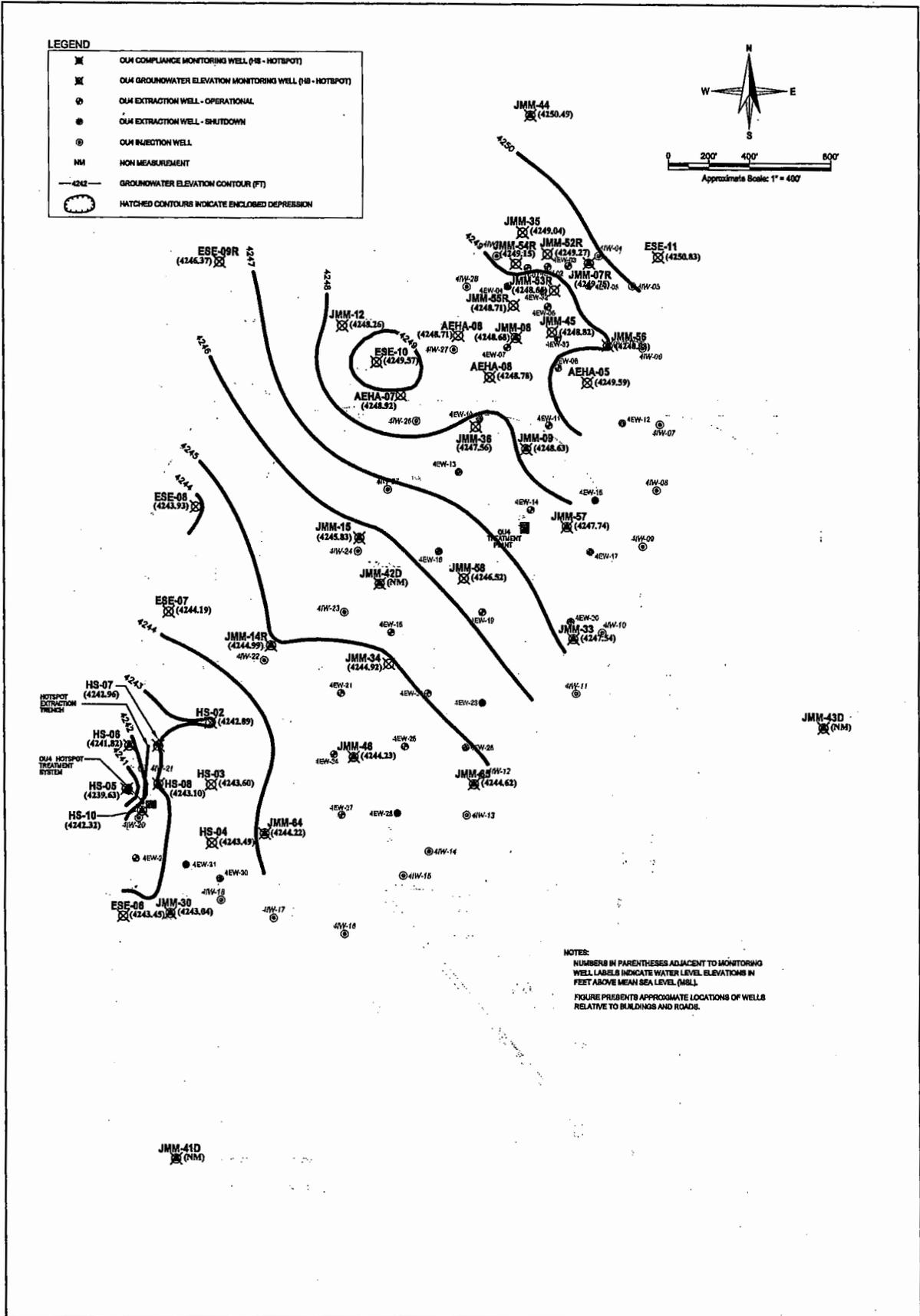


**US Army Corps
of Engineers ®**
Sacramento District

prepared by:



www.americanconsultants.com



Prepared by:

 Date: November 1, 2005
 Project: 4018 DDDHU
 OUM_10_2_monitoring_POR.dwg

Prepared for:

 US Army Corps of Engineers
 Sacramento District

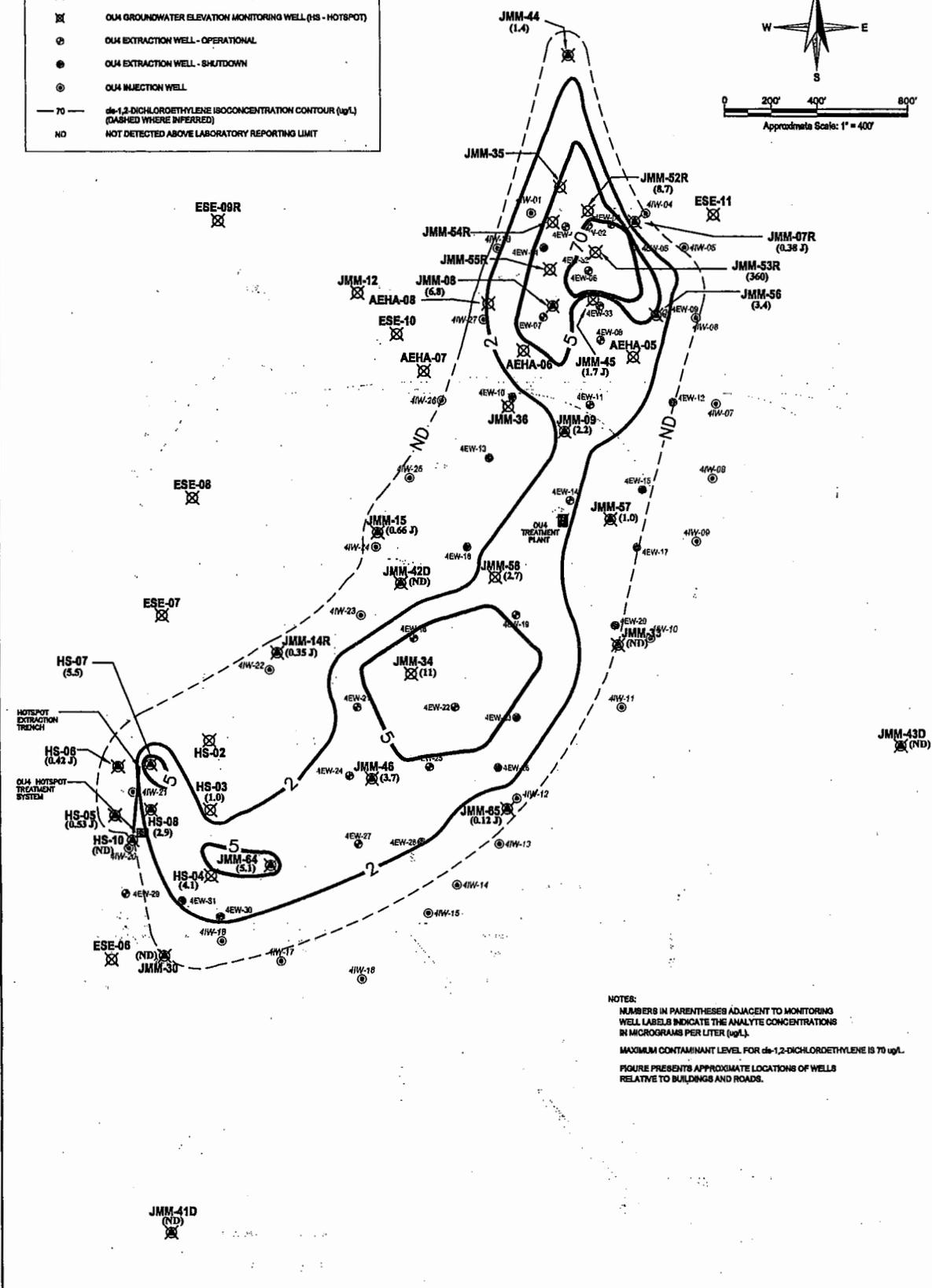
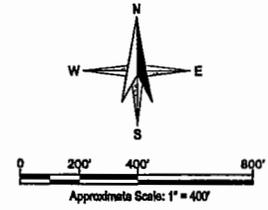
JULY 2005
GROUNDWATER ELEVATION
CONTOUR MAP

Operable Unit 4 and
 Operable Unit 4 Hotspot
 Defense Distribution Depot Hill
 Ogden, Utah

FIGURE
8

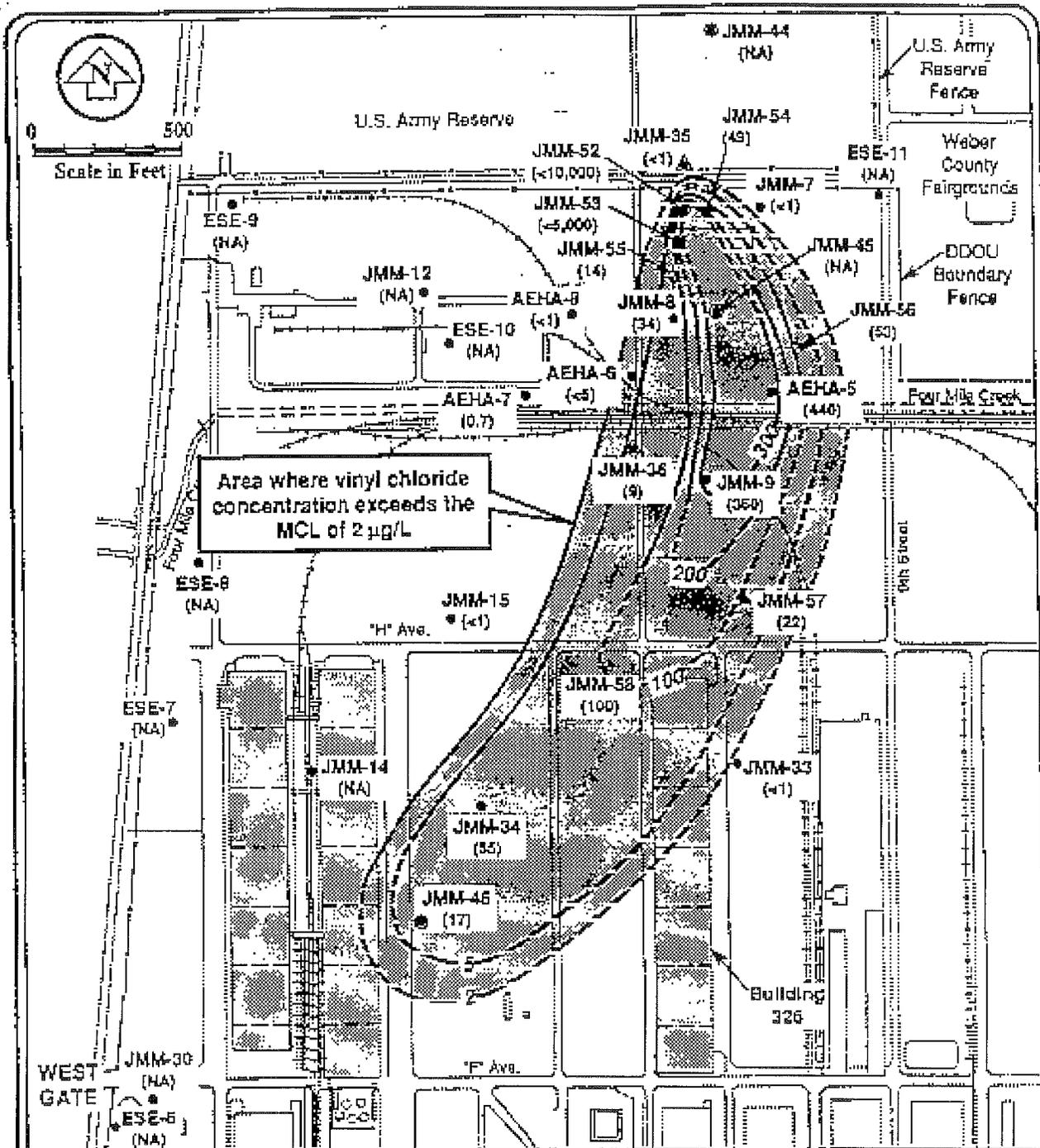
LEGEND

	OUM COMPLIANCE MONITORING WELL (HS - HOTSPOT)
	OUM GROUNDWATER ELEVATION MONITORING WELL (HS - HOTSPOT)
	OUM EXTRACTION WELL - OPERATIONAL
	OUM EXTRACTION WELL - SHUTDOWN
	OUM INJECTION WELL
	70 μ g/L <i>cis</i> -1,2-DICHLOROETHYLENE ISOCONCENTRATION CONTOUR (μ g/L) (DASHED WHERE INFERRED)
	ND NOT DETECTED ABOVE LABORATORY REPORTING LIMIT



NOTES:
 NUMBERS IN PARENTHESES ADJACENT TO MONITORING WELL LABELS INDICATE THE ANALYTE CONCENTRATIONS IN MICROGRAMS PER LITER (μ g/L).
 MAXIMUM CONTAMINANT LEVEL FOR *cis*-1,2-DICHLOROETHYLENE IS 70 μ g/L.
 FIGURE PRESENTS APPROXIMATE LOCATIONS OF WELLS RELATIVE TO BUILDINGS AND ROADS.

<p>Prepared by: Date: November 1, 2005 Project: 4018 DCHU OUA_10_2_05 amended_1107.dwg</p>	<p>Prepared for: US Army Corps of Engineers Sacramento District</p>	<p>JULY 2005 cis-1,2-DICHLOROETHYLENE ISOCONCENTRATION MAP</p>	<p>Operable Unit 4 and Operable Unit 4 Hotspot Defense Distribution Depot Hill Ogden, Utah</p>	<p>FIGURE 7</p>
---	---	---	---	-----------------------------



Area where vinyl chloride concentration exceeds the MCL of 2 µg/L

EXPLANATION

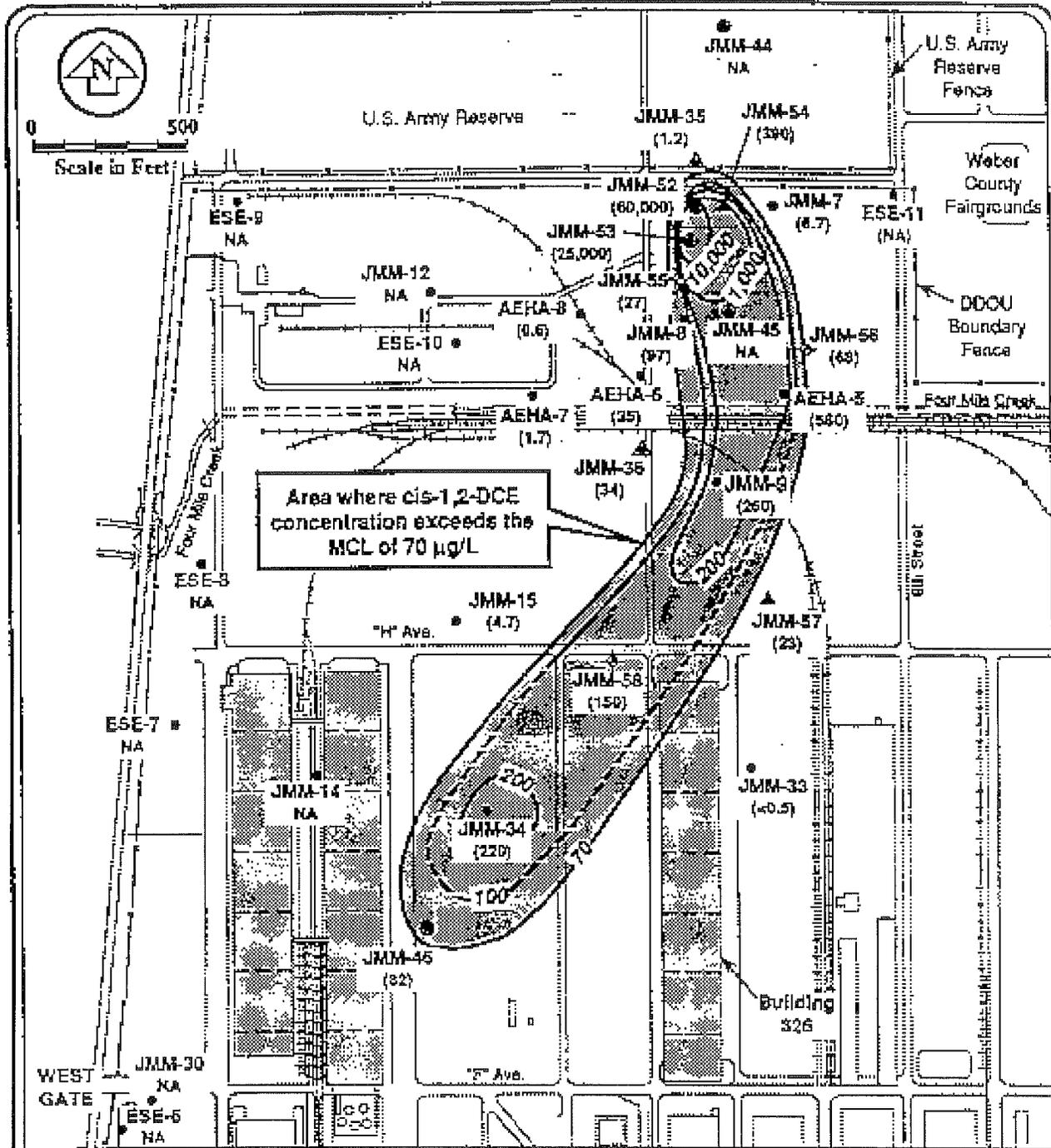
- ▲ Phase IV dense non-aqueous phase liquid (DNAPL) shallow monitoring well location
- ◆ Phase IV shallow monitoring well location
- Phase III shallow monitoring well location
- ▲ Phase II dense non-aqueous phase liquid (DNAPL) shallow monitoring well location
- Pre-phase III shallow monitoring well location

- Note: Bladder pump sampling technique used.*
- JMM-23 Well number
 - (23) Vinyl chloride concentration (µg/L)
 - (<1) Vinyl chloride concentration less than detection limit shown (µg/L)
 - - - Isoconcentration line (µg/L); contour interval varies; contour lines are dashed where inferred

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James M. Montgomery
 Consulting Engineers Inc.
 DDOU OU 4 RIFS

FIGURE 15. Vinyl Chloride Groundwater Contamination, DDOU, OU 4



Area where cis-1,2-DCE concentration exceeds the MCL of 70 µg/L

EXPLANATION

- ▲ Phase IV dense non-aqueous phase liquid (DNAPL) shallow monitoring well location
- ◆ Phase IV shallow monitoring well location
- Phase III shallow monitoring well location
- ▲ Phase II dense non-aqueous phase liquid (DNAPL) shallow monitoring well location
- Pre-phase III shallow monitoring well location

JMM James M. Montgomery Consulting Engineers Inc.



DDOU OU 4 RWFS

- Note: Bladder pump sampling technique used.
- JMM-23 Well number
 - (23) Vinyl chloride concentration (µg/L)
 - (<1) Vinyl chloride concentration less than detection limit shown (µg/L)
 - Isoconcentration line (µg/L); contour interval varies; contour lines are dashed where inferred

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FIGURE 12. Cis-1,2-DCE Groundwater Contamination at DDOU, OU

EPA recognizes former Defense Depot Ogden, Utah Cleanup Efforts

By Michael Dobbs, DDC Environmental

Max Dodson, Assistant Regional Administrator for the Environmental Protection Agency (EPA) Region VIII presented Certificates of Appreciation to Defense Logistics Agency (DLA) representatives Dell Fredde and Ron Smith, and Corps of Engineers representative, Paul Feldman, for their outstanding performance in remediating the former Defense Distribution Depot Ogden, Utah (DDOU) property to a level that makes it transferable to the Ogden Reuse Authority while promoting reuse in a ceremony held September 18, 2002.

Dodson, a former DLA employee, said the three key elements that led to Ogden's success and should be used as a benchmark for other DoD sites were "true partnership between all stakeholders, a common sense approach to site restoration, and innovative approaches to phased Findings of Suitability to Transfer (FOST)."

In September 1995, the Base Realignment and Closure (BRAC) Commission recommended closure of DDOU and the site was officially closed in September 1997. A preliminary assessment of DDOU identified 107 sites that required investigation and or further remediations before they could be declared environmentally safe and no further threat to health.

All 107 sites have now been cleaned up, with two ground-water pump and treatments systems in place that were determined by EPA to be operating properly and successfully.

With long-term monitoring and land use controls in place, the former DDOU is slated to transfer the remaining property, approximately 240 acres, to the Ogden Local Redevelopment Authority by November 2002.

The redevelopment of the former DDOU is well underway with the infrastructure improvements well ahead of plan. By 2007—8 years ahead of schedule - more than \$18 million of improvements will be complete or under contract with another \$30 million of improvements planned.

These investments have already defined Business Depot Ogden as the premier business and industrial park in Utah. Only three-years into redevelopment 1,258 jobs have been retained or created. This is a rate of job creation 100 times faster than job creation for the rest of the county.

Warehouse space has been reused as manufacturing space, new manufacturing space has been constructed and additional construction of pre-leased manufacturing space is underway.



Pictured from left to right are: Dell Fredde, Max Dodson, Ron Smith, and Paul Feldman.



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The below list only includes contaminants identified as contaminants of concern (COCs) for this site. COCs are the site-specific chemical substances that the health assessor selects for further evaluation of potential health effects. Identifying contaminants of concern is a process that requires the assessor to examine contaminant concentrations at the site, the quality of environmental sampling data and the potential for human exposure.

<u>Media</u>	<u>Contaminant</u>	<u>Contaminant Group</u>
Groundwater	1,1,1-TRICHLOROETHANE	VOC
Groundwater	1,1-DICHLOROETHANE	VOC
Groundwater	1,1-DICHLOROETHYLENE	VOC
Groundwater	1,2-TRANS-DICHLOROETHYLENE	VOC
Soil	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)	Dioxins/Dibenzofurans
Debris	2-CHLOROACETOPHENONE	PAH
Groundwater	4,4-DDD	Pesticides
Groundwater	AROCOLOR 1260	PCBs
Debris, Groundwater, Soil	ARSENIC	Metals
Debris, Soil	BARIUM	Metals
Debris	BASE NEUTRAL ACIDS	Base Neutral Acids
Debris, Groundwater, Soil	BENZENE	VOC
Soil	BENZOIC ACID	Base Neutral Acids

Soil	BROMACIL	Pesticides
Groundwater	BROMOFORM	VOC
Debris, Soil	CADMIUM	Metals
Groundwater	CARBON DISULFIDE	VOC
Groundwater, Soil	CHLORDANE	Pesticides
Groundwater	CHLOROFORM	VOC
Debris	CHLOROPICRIN	Pesticides
Debris, Soil	CHROMIUM	Metals
Debris, Groundwater, Soil	CIS-1,2-DICHLOROETHYLENE	VOC
Groundwater	DELTA-BHC	Pesticides
Groundwater	DICHLOROMETHANE	VOC
Debris	DIOXINS/DIBENZOFURANS	Dioxins/Dibenzofurans
Groundwater	ENDOSULFAN	Pesticides
Debris	INORGANICS	Inorganics
Soil	LEAD	Metals
Debris, Soil	LEAD, INORGANIC	Metals
Debris	LEWISITE	Base Neutral Acids
Debris, Soil	MERCURY	Metals
Debris	MUSTARD GAS	Organics
Debris, Soil	NAPHTHALENE	PAH
Debris, Groundwater, Soil	ORGANICS	Organics
Soil	PCBs	PCBs
Debris, Soil	PERCHLOROETHYLENE	VOC
Groundwater	PETROLEUM HYDROCARBON	Petroleum Hydrocarbon
Debris	PHOSGENE	Pesticides
Groundwater, Soil	TRICHLOROETHYLENE	VOC
Debris, Groundwater, Soil	VINYL CHLORIDE	VOC
Debris, Soil	ZINC	Metals

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OU	Action Name	Qualifier	Lead	Actual Start	Actual Completion
00	PROPOSAL TO NPL		F		10/15/1984
01	FF COMMUNITY INVOLVEMENT		FF	01/05/1985	04/01/1985
00	R/FS NEGOTIATIONS		FE	11/15/1984	05/15/1986
00	CONSENT AGREEMENT (ADMINISTRATIVE)		FE		06/30/1986
00	FINAL LISTING ON NPL		F		07/22/1987
01	STATE SUPPORT AGENCY COOP AGREEMENT		S	12/23/1988	03/03/1989
00	FEDERAL INTERAGENCY AGREEMENT		FE		09/29/1989
00	IAG NEGOTIATIONS		FE	04/21/1989	09/29/1989
00	Notice Letters Issued		FE		10/03/1989
00	R/FS NEGOTIATIONS		FE	01/26/1988	11/30/1989
02	RECORD OF DECISION		FF		09/27/1990
02	FF R/FS		FF	09/29/1989	09/27/1990
02	ADMINISTRATIVE RECORDS	E	FF	05/10/1989	09/27/1990
01	RISK/HEALTH ASSESSMENT		FF		12/06/1991
02	FF RD		FF	12/21/1990	05/01/1992
01	RISK/HEALTH ASSESSMENT		FF		05/11/1992
01	FF R/FS	H	FF	09/29/1989	06/26/1992
01	RECORD OF DECISION		FF		06/26/1992
01	ADMINISTRATIVE RECORDS	E	FF	05/10/1989	06/26/1992

03	ADMINISTRATIVE RECORDS	E	FF	05/10/1989	09/28/1992
03	RECORD OF DECISION		FF		09/28/1992
03	FF RI/FS		FF	11/05/1990	09/28/1992
04	ADMINISTRATIVE RECORDS	E	FF	05/10/1989	09/28/1992
04	FF RI/FS		FF	09/29/1989	09/28/1992
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03	FF RD		FF	01/08/1993	10/04/1993
02	Explanation Of Significant Differences		FF		08/30/1994
01	FF RA		FF	01/25/1994	09/29/1994
03	Explanation Of Significant Differences		FF		02/28/1995
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01	FF RA	H	FF	09/24/1993	09/27/1995
02	FF RA		FF	02/03/1992	09/27/1995
03	FF RA		FF	10/25/1993	09/27/1995
04	FF RA		FF	11/01/1993	09/27/1995
04	PRELIM CLOSE-OUT REP PREPARED		F		09/28/1995
02	FF FIVE YEAR REVIEW		FF	01/23/1996	06/21/1996
02	FYR Report Due		FF		06/21/1996
02	OPERATIONS AND MAINTENANCE		FF	10/01/1992	10/08/1996
02	Explanation Of Significant Differences		FF		10/15/1996
00	INTEGRATED ASSESSMENT		FF	01/20/1997	01/30/1997
00	INTEGRATED ASSESSMENT		FF	01/20/1997	01/30/1997
00	INTEGRATED ASSESSMENT		FF	01/20/1997	01/30/1997
00	INTEGRATED ASSESSMENT		FF	01/20/1997	01/30/1997
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00	SITE INSPECTION		FF	09/09/1997	09/12/1998

00	SITE INSPECTION	FF	09/09/1997	09/12/1998
04	FF RA	FF	08/18/1998	02/09/1999
00	INTEGRATED ASSESSMENT	FF	09/26/1997	09/07/1999
00	INTEGRATED ASSESSMENT	FF	09/26/1997	09/20/1999
00	INTEGRATED ASSESSMENT	FF	09/26/1997	09/20/1999
04	FF RA	FF	09/28/1998	12/17/1999
04	ROD Amendment	FF		08/09/2000
01	Explanation Of Significant Differences	FF		09/13/2000
00	FF FIVE YEAR REVIEW	FF	05/19/2001	09/19/2001
00	FYR Report Due	FF		09/19/2001
00	Restoration Advisory Board	FF	01/30/1996	07/23/2002
00	FF COMMUNITY INVOLVEMENT	FF	01/30/1996	07/23/2002
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02	FRENCH DRAIN AREA
03	BURIAL SITE 3
04	BURIAL SITE 4

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Appendix

Northern Utah State Veterans Nursing Home
Department of Veterans Affairs
Ogden, Utah

6.4 VA Nursing Home Design Guide



Department of
Veterans Affairs
Office of Facilities Management

designguide

2006

NURSING HOME



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Foreword

The Nursing Home Design Guide 2006 signals a significant change in VA's approach to the environment of care for Long Term Care residents. It is an extremely important addition to the series of Design Guides for various elements of the United States Department of Veterans Affairs facilities produced by the Office of Facilities Management. This excellence was achieved with the indispensable input of: Lorraine G. Hiatt, Ph.D.; Martin Cohen, FAIA; Christa M. Hojlo, DNSc; and Dennis Hancher, RA. They gave countless unstinting effort to the creation of this document which signals the transformation of the culture of care in VA, discussed by Dr. Hojlo in the Introduction. Their extensive experience in this subject, supplemented by traveling to look at and meet with staff and residents at VA, State, and private sector Nursing Homes across the country, was further assisted by the experts in the Nursing Home Design Advisory Group and the consulting services of EBA Ernest Bland Associates, P.C.

This volume is meant to be a guide, not a code or regulation. It reflects the best practices of care and supporting facility design concepts for creating functional, pleasing, nurturing, and efficient environments for those veterans who reside in VA or State sponsored Nursing Homes, as well as for those who serve and honor the residents.

The drawings illustrate possibilities, meant to allow deviation, not always to be copied without variation. Although the guide illustrates some double room layouts, it is VA's strong preference to create only single bedrooms, except for special requirements. The dignity, privacy, and special needs of the individual residents must be paramount. Those who have served the Nation will live in these buildings, perhaps for the remainder of their lives, and deserve no less.

Lloyd H. Siegel, FAIA

Introduction

This nursing home design guide represents a unique collaborative effort on the part of architects, nursing home providers, clinicians, and others to set forth an approach to designing and building nursing homes based on a resident centered, resident focused approach to care. The guide represents the best thinking of experts who are committed to transforming the culture of care in nursing homes built on the notion that in large part, the actual facility design itself contributes to the well being and positive outcomes of care in such facilities.

The transformation of the culture of care in nursing homes is grounded in two essential principles:

1. The resident comes first, and
2. Nursing homes today and into the future are defined as a dynamic array of services when hospital care is no longer necessary and nursing home is the only option.

Nursing homes have suffered from their affiliation with the hospital model, negative press, and overall institutionalization of those who need this service. The transformation of the culture of care in nursing homes focuses attention on enhancing the resident's ability to function and live fully until he or she dies. The driver of care in the new culture is achieving "the highest

practicable quality of life" for residents rather than solely treating the medical diagnosis.

The new culture embraces the resident as the focal point of care and delivers an environment conducive to facilitating quality of life as well as quality of care while overriding the negative stereotypes. Very personal components of residing in the nursing home such as the need for privacy, the need for natural light, comfortable and safe flooring, engagement in meaningful use of time, inviting dining experiences, and living space that generates elements of the comforts of home, are characteristics of the new nursing home.

Design that enhances the physical environment to support quality of life for the resident is critical to positive outcomes of care regardless of why the resident is admitted to the nursing home.

The challenge then, from a design perspective, is to de-institutionalize the facility space in order to promote fullness of life for residents regardless of reason for admission. This guide then will serve as a resource for those embarking on the path of creating environments where residents thrive in ways never imagined possible in institutions of care.

Glossary

Adjacency Matrix:	A diagram illustrating the relative proximity of each workspace to other workspaces.
Americans with Disabilities Act:	Legislates access for disabled persons in most privately owned buildings or businesses that serve the public.
Assignable Space:	A measurement of space attributable to a distinct function or service including support areas and intradepartmental circulation. Defines Net Square Feet.
Bay:	The space in a building generally bounded by four columns.
Biaxial:	Equal space as well as equal access to light, controls, etc. within a resident bed room.
Case Mix:	Case Mix categorizes patients into statistically and clinically homogeneous groups based on the collection of clinical and administrative data. Adjusting for patients of different levels of acuity forms the basis for healthcare organization comparisons and case mix adjusted resource utilization.
Certificate of Need (CON)	Certificate of Need (CON) is a formal statement that a health care facility, medical equipment purchase, or new medical or expanded service is needed, or that a reduction or termination in service will not have an adverse affect on health care access.
Circulation Area:	Entrances, vestibules, (interdepartmental) corridors, passages, elevators, escalators, stairs, etc; included in gross areas and excluded in net areas.
Correlated Color Temperature (CCT):	Describes the degree to which a color appears warm (reddish), neutral or cool (bluish) and is measured in Kelvin (K).
Departmental Gross Square Feet	The sum of gross spaces in a department.
Eden Concept:	A vibrant living habitat in which residents are given the opportunity to show their care, love and concern for other living things.

Glossary (cont'd)

Footprint:	Describes the actual floor area for a function or activity; it does not include circulation space. Also refers to the building floor plate.
Geriatric Research, Education & Clinical Center (GRECC)	The GRECC program was conceived in 1973 to focus on aging as a special interest for VA. The purpose of GRECCs is to give visibility to the study of geriatrics or diseases of the elderly, and the study of the aging process-gerontology. GRECCs support a multi-disciplinary approach to research, education, and clinical care at each center.
Gross Square Feet:	Total building gross areas measured from exterior faces of exterior walls.
Indoor Air Quality (IAQ):	Refers to the quantitative level of contaminations in the air as well as the qualitative level of satisfaction of those exposed to the air. Standards for acceptable IAQ have been developed by the U.S. Environmental Protection Agency.
Layout:	A floor plan showing the specific placement of walls, doors, furniture, and equipment.
Leadership in Energy and Environmental Design (LEED _{tm})	LEED _{tm} includes a rating system for building design as well as professional accreditation for people working in the design and building industry.
Mechanical Area	Main boiler room and other mechanical and electrical areas; included in gross areas and excluded in net areas.
Minimum Data Set (MDS)	A standardized assessment instrument required for all Centers for Medicare and Medicaid Services (CMS) certified nursing homes.
National Fire Protection Association:	Produces a code used in many jurisdictions to define fire protection requirements of building codes.
Net Area	The area of rooms or spaces as measured from inside wall to inside wall and assigned to functional use by occupants.
Net-to-Gross:	A measure of the ratio of assignable space to total space in a building; typically expressed as a percentage.

Glossary (cont'd)

Nurses' Station	Location at which nursing staff traditionally performs charting and related activities throughout the day.
Off-gassing:	The release of chemicals from non-metallic substances used in construction or furnishing. Off-gassing compromises indoor air quality (IAQ). Common sources of off-gassing include interior-grade pressed wood materials and synthetic furnishings such as carpeting.
Resident Bed Room	A room in the facility licensed for one or more patient beds.
Resident Centered Care	Facility design model that focuses care resources around the individual resident. Essential services are near or are brought to the resident as compared to taking the resident to the point of care.
Residential Model	Design philosophy based on incorporating home like elements while minimizing institutional aspects.
Responsible Design:	Architecture that respects the natural environment and integrates it into building design, addresses the health of individuals and community, and is sensitive to the cultural context of the site.
Resource Utilization Group (RUG)	Nursing home resident categories that identify resident needs and resources for care.
Site:	The land parcel on which the building(s) sits or will be built. It includes the grounds, driveways, and walkways associated with the building(s).
Uninterruptible Power Supply (UPS):	Generators, batteries, and/or associated equipment that provide continuous electrical power, preventing power loss to critical functions that rely on absolute continuity of service.
United States Green Building Council (USGBC)	The United States Green Building Council is a national coalition of leaders in the building industry that developed the LEED [™] system.
Veterans Integrated Service Network (VISN):	The VA healthcare system consists of 21 integrated networks across the US and Puerto Rico that are focused on pooling and aligning resources to better meet local health care needs and provide greater access to care.

Abbreviations

A	Amps
ABA	Architectural Barriers Act
AC/HR	Air Changes per Hour
ADA	Americans with Disability Act
ADAAG	ADA Accessibility Guidelines
AHJ	Authority Having Jurisdiction
AIA	American Institute of Architects
ANSI	American National Standards Institute
AR	As Required
BOMA	Building Owners and Management Association
CAD	Computer Assisted Design
CARES	Capital Asset Realignment for Enhanced Services
CFM	Cubic Feet per Minute
CON	Certificate of Need
DAG	Design Advisory Group
EPA	Environmental Protection Agency
FC	Foot Candle
FM	Office of Facilities Management
FTEE	Full Time Equivalent Employee
GRECC	Geriatric Research, Education and Clinical Center
GSF	Gross Square Feet
GSM	Gross Square Meters
HIPAA	Healthcare Insurance Portability and Accountability Act
HP	Horsepower
HPD	Hours per Day
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

Abbreviations (cont'd)

LEED	Leadership in Energy and Environmental Design
LUX	Lumen Per Square Meter
MDS	Minimum Data Set
NFPA	National Fire Protection Association
NHCU	Nursing Home Care Unit
NHRA	Nursing Home Reform Act (of 1987)
NSF	Net Square Feet
NSM	Net Square Meters
NTS	Not to Scale
OBRA	Omnibus Budget Reconciliation Act (of 1987)
OSHA	Occupational Safety and Health Administration
OT	Occupational Therapy
PG	Program Guide
PT	Physical Therapy
RUG	Resource Utilization Group
RH	Relative Humidity
RT	Recreation Therapy
SF	Square Feet, Square Foot
SVH	State Veterans Home
SqM	Square Meters
TV	Television
UBC	Uniform Building Code
UFAS	Uniform Federal Accessibility Standards
UPS	Uninterruptible Power Supply
USGBC	United States Green Building Council
V	Volts
VA	Department of Veterans Affairs
VACO	Veterans Affairs Central Office

Abbreviations (cont'd)

VAMC	Veterans Affairs Medical Center
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network
VSO	Veterans Service Organizations
W	Watts

1.0 NARRATIVE

1.1 General Considerations

The Department of Veterans Affairs (VA) provides Nursing Home care in three settings:

1. VA Nursing Home Care Units (NHCUs)

These are owned and operated by the Department of Veterans Affairs. These facilities provide all levels of care with a focus on short stay including skilled nursing and rehabilitation. Eligibility requirements must be met.

2. Community Nursing Home Program.

These are community based facilities owned and operated by private enterprises. They provide all levels of care with a focus on long stay residents. Services for veterans may be contracted by the VA Medical Center of jurisdiction. Eligibility requirements for VA contracts must be met. Medicaid/Medicare or private pay are payment options for veterans not under VA contract in community Nursing Homes.

3. State Veterans Home (SVH) Program.

The State Veteran Home Program is a grant program whereby VA contributes a portion of construction and per diem costs. SVH's are owned and operated by the states. Quality oversight is provided by VA. Eligibility is limited to veteran status.

Typical stays in State Veterans Homes and in the Community Nursing Home Program are generally longer than in VA facilities. However, regardless of facility

setting, both short stay and long stay resident care are to be accommodated.

1.1.1 General Trends in Nursing Home Care Design

Historically, design layouts for Nursing Homes were derived from hospital design models with the understanding that care mimicked hospital care but was less intense. There was little to no clarity about the possibility of engaging the resident in life as fully as possible. This applies even to those with significant functional disability or impairment, permanent or temporary.

The profile of today's Nursing Home resident is that many, or most, are physically active in the facility. VA Nursing Home should be viewed from the perspective of a residential environment rather than a hospital. The interior of the Nursing Home facility should include features that serve the needs of the residents and should reflect that extended periods of time are spent indoors. VA Nursing Homes have committed to transforming the culture of Nursing Home care to embrace a more home-like environment. This culture should remain constant and evident throughout the design of the Nursing Home care facility.

In addition to providing for residents' healthcare needs, Veterans' Nursing Homes should include a variety of social activities. These activities should be located both on and off the unit, and should be customized according to mental and physical needs.

1.1.2 VA Trends in Nursing Home Care

The projected aging of the veteran population is an important driving force in the design of VA Nursing Homes.

VA realizes that those most vulnerable of the older veteran population, particularly those over 85, are most likely to require some level of care including short or long term institutional Nursing Home care.

Nursing Home care is only one aspect of a continuum of care. It is important that Veterans are placed in the least restrictive, most cost effective, and most desirable setting possible. Nursing Home care is reserved for those whose functional limitations and resources are such that institutional care is the best alternative.

VA's approach to Nursing Home care has evolved from a hospital focused model to one that is resident-centered and home-like. It has been determined that Nursing Homes should focus care resources around the individual resident instead of taking the resident to the point of care.

There are various types of services that Nursing Homes provide such as dementia care, spinal cord injury care, short stay skilled nursing, short stay rehabilitation, long stay maintenance, hospice and respite care. Understanding that each of these distinct services requires a unique set of competencies has implications for overall facility design.

Although VA owns and operates its own NHCUs, VA recognizes that the needs

of veterans may also be served by encouraging the individual states to develop state Nursing Homes in locations that are convenient to veteran populations.

1.1.3 Codes, Standards and Executive Orders

VA functions as the Authority Having Jurisdiction (AHJ) for all VA facilities and projects and has the responsibility to guard public health and safety through enforcement of its adopted codes. VA is not subject to enforcement of local and state codes.

Local authorities should be notified about planning projects and given the opportunity to review drawings. Although there are exceptions, formal drawing reviews, building permits, inspections and fees do not generally apply to Federal facilities.

Design, construction, renovation and installation of all VA Nursing Home Care Units (NHCUs) must be in accordance with this document and with the latest editions and/or revisions of all applicable codes and standards.

It is recommended that all other Nursing Homes serving US veterans, such as State Veterans Homes, also comply with the codes and standards referenced here. The more stringent code and/or standard are to be applied to VA facilities. Nothing in this Design Guide should be construed as authorization or permission to disregard or violate local and legal requirements.

1.2 Functional Considerations

1.2.1 Operations: Services

The Nursing Home is divided into the following functional areas:

1. *Resident Care Units* are organized into four sub-areas including bedrooms for the resident rooms and adjoining toilet/shower rooms, staff areas required to provide clinical support to operate the resident unit, resident areas for activities and dining, and unit support for utility, office and miscellaneous functions used to assist staff in managing resident units.

2. *Therapeutic Services* offer space adjacent to resident care units for the therapies such as physical therapy, occupational therapy and pharmacy.

3. *Resident Support Services* provide for the resident amenities and social services such as chapel/meditation, barber/beauty shop, and resident storage.

4. *Administrative Services* provide a variety of management and public functions: admissions/registration, lobby, medical records, and management offices.

5. *Logistical Services* provide for the supply needs of the facility and include receiving/loading, bulk stores, laundry and food preparation. The level of services provided depends on the building systems and the availability of contract services or those available from a host organization such as a medical center.

6. *Environmental and Maintenance Services* provide for the upkeep and protection of the facility and include housekeeping, maintenance/ engineering and security. The level of services provided depends on systems and the availability of contract services or those available from a host organization.

1.2.2 Operations: Concepts

The Nursing Home is organized around the following concepts:

1. *Resident Care* should be provided in spaces that are flexible enough to accommodate changing resident care needs. The spaces represented in the guide plates provide flexibility for future changes.

Resident care areas and other areas where staff interact with residents may require additional acoustical treatment to reinforce resident privacy.

2. *Level of Care* may vary in terms of levels of impairment and skilled care needs. Specific rooms and their interior design need to be coordinated with the expected level of care to be delivered. The size of resident units and individual spaces need to reflect level of care.

3. *Market Sensitivity* should be considered in the delivery of Nursing Home care services. In terms of amenities and service, Nursing Home facilities used by veterans need to be designed comparatively with private sector facilities and programs.

Nursing Home facilities need to be user-friendly for both the veteran and his or her family and staff.

4. *New Concepts* in the delivery of Nursing Home care should be considered. These include naming units or sub-units thematically instead of alphanumeric designations, eliminating and/or decentralizing nursing stations, and creating bright and inviting country kitchens for dining and socialization.

1.2.3 Space Planning and Design

1. Flexibility

The design of Nursing Home facilities needs to respond to changing workloads, care objectives, and technologies such as wireless technologies for staff.

- Spaces should be universally designed to accommodate a range of related functions.
- Generic plans should be developed to respond to changes in use and assignment.
- Special spaces need to be designed and grouped to accommodate a range of functions and to accommodate change if possible.

2. Efficiency

The design of Nursing Home facilities should provide resources to accommodate increasing health care demands.

- Support spaces, such as storage and utility rooms, should be designed to be shared where possible to reduce the overall need for space.
- Functions with requirements, such as facility supply and transport areas, should be grouped or combined to achieve efficiency of operation.

- Duplication of facilities should be minimized where limited resources are available.

3. User Needs

Resident dignity and respect for individuality should be accommodated while considering operational realities.

Resident vulnerability to stress from noise, lack of privacy, poor or inadequate lighting and other causes, and the subsequent harmful effect on well being, are known and documented phenomena.

An inherent opportunity exists in the design of Nursing Home facilities to address the above issues and to offer creative solutions to enhance resident comfort and contribute to positive outcomes.

A key architectural objective should be to reduce emphasis on the institutional aspects of care and to surround the resident and family with furniture, furnishings and fixtures that are more homelike, i.e., residential and comfortable.

Proper planning and design appeal to the spirit and sensibilities of both residents and care providers. A spirit of neighborhood or household should be encouraged.

Nursing Home facilities need to be environments of healing that allow the building itself to be part of the therapeutic setting. The technical requirements to operate the building should be unobtrusive and integrated in a manner to support this concept.

Sufficient space should be allocated for equipment and supplies to avoid storing or parking of medical equipment including medication carts and assistive devices in public view, in corridors, or in showers. Resident privacy needs to be provided while encouraging socialization and other group activities.

Security, both from a resident and a facility perspective, needs to be addressed by planning, design and detail considerations.

Access needs to be provided by application of UFAS and ADA design standards to room and fixed equipment layouts.

Most Nursing Home resident units need to be located at grade. For some specialty programs, such as dementia care, location at grade is mandatory.

1.2.4 Functional Relationships

1. Work Flow

The Functional Diagram reflects the function, organization of spaces, flow of residents/staff/materials, and operational issues. (See figure 1 4). These relationships should not be interpreted as preconceived or prescribed layouts.

2. Organizational Concepts

Where possible, facility planning and design should follow a modular concept to promote flexibility, encourage construction efficiencies, and promote staff orientation.

3. Space Allocation

Net square footage requirements discussed and shown in guide plates are intended to be consistent with

revisions to space planning criteria. Refer to Section 2.5 Guideplates, Reflected Ceiling Plans and Data Sheets.

1.3 Technical Considerations

1.3.1 Architectural

1. Partitions

Interior partitions primarily should be gypsum wallboard on metal studs that are either painted or wallpapered. Interior partitions around resident rooms should have sound attenuation features such as batts between studs. Other areas where significant noise may be generated also should have sound attenuation features.

Consideration should be given to acoustically treating spaces to minimize resident privacy issues.

2. Floors

Floors for the Nursing Home facility should not be reflective or glossy. Flooring should be readily cleanable and unaffected by germicidal cleaning solutions. In food consumption and preparation areas, floors should be water resistant.

Floors in resident living areas and other areas at high risk for spread of infections should be of non-porous material other than carpet such as vinyl composition tile. Carpeting can be used in a NHCU, however, the designer must be selective as to what type of carpet is proposed and where it is to be used. (See Section 2.3 Perception and Interiors)

Floors in high-traffic areas such as offices and administrative service areas should be carpeted with a 4" [100 mm] high resilient base.

Floors in toilet/shower rooms and bathing suites should be non-slip, ceramic tile with a non-slip, ceramic tile base. Floors in medical exam rooms, therapeutic services and most other spaces should be vinyl composition tile with a 4" [100 mm] high resilient base.

3. Ceilings

Ceilings primarily should be lay-in acoustic ceiling tile installed in an exposed or semi-concealed suspension system.

4. Protection/Safety

Continuous handrails should be used in resident hallways and other pathways. Wall and ceiling guard protection should be used in all areas subject to damage from cart or other service traffic.

5. Interior Doors and Hardware

Interior doors should be 1 3/4" [44 mm] thick, solid-core, flush-panel wood doors or hollow metal doors in hollow metal frames. Hollow metal doors should be used where high impact is a concern and where fire rated doors are required.

Interior door width for general resident rooms and toilet/shower rooms should be 48" [1220 mm]. Interior door width for special care resident rooms and toilet/shower rooms should be 48" [1220 mm].

Accessible hardware should be used throughout the Nursing Home facility. Automatic door openers should be used for the special care resident rooms.

1.3.2 Structural

Executive Orders 12699 and 12941 require that all new and existing buildings constructed or leased by the Federal Government be seismically safe. The EOs require that nationally recognized building codes be used for the seismic design and construction of new buildings, and for the seismic safety assessment of existing buildings. For structural systems, International Building Code, 2003 Edition, should be followed.

1.3.3 Equipment

1. Casework

Modular casework storage systems should be chosen for flexibility including the incorporation of dimensions for ease of multiple re-use applications. Casework systems should be integrated with space planning to avoid corner installations and filler panels.

2. Management Information Systems

Management Information Systems (MIS) should be planned and designed on an individual facility basis to meet needs. The amount of information that is assembled and distributed through MIS is increasing at a rapid rate and expansion to meet future needs should be considered.

3. Headwall Equipment Management Systems

The Nursing Home facility may be designed to accommodate headwall systems incorporating in-wall medical gases, nurse call, lighting, and power outlets.

1.3.4 Heating, Ventilation and Air Conditioning

1. Operation

HVAC systems should be provided to heat, cool and ventilate individual rooms or areas as required to satisfy design criteria.

2. Capacities

Supply air volume should be established to meet the cooling load requirements of the occupied space. The supply volume should be modified to meet minimum air change requirements or to maintain proper space pressurization relative to room exhaust requirements.

3. Air Quality and Distribution

Typically, clean areas such as clean utility should have positive air pressure and soiled areas such as soiled utility, toilet/shower rooms and storage rooms should have negative air pressure with respect to adjoining areas.

Corridors should not be used to supply or to exhaust/return air from rooms.

Corridor air may be used to ventilate toilets, housekeeping closets and small electrical or telephone closets opening directly on corridors.

HVAC design should minimize the short circuiting of air between supply and exhaust vents in rooms or areas.

4. Exhaust System

Exhaust systems should be designed to provide exhaust air to spaces to control the transfer of odors and provide proper room pressurization. Exhaust air and pressurization should be provided to match requirements for specific rooms or areas as specified in facility design.

5. Seismic (implications)

Where required, earthquake resistant design should be used for HVAC systems in accordance with current codes and standards.

6. Noise Level

HVAC equipment and ductwork should provide resulting sound levels not to exceed 45 maximum NC levels in dining areas, 40 maximum NC levels in toilet/shower rooms, and 35 maximum NC levels in all other occupied spaces.

1.3.5 Plumbing

1. Water and Waste Systems

Plumbing service should be extended to the facility to serve the domestic hot and cold and fire protection systems.

The Nursing Home facility's cold water should be piped to all required plumbing fixtures and equipment. Hot water should be piped to all required plumbing fixtures and equipment. A hot-water recirculation system should be provided.

Plumbing fixture types and flow restrictors should be in accordance with the most current version of the National Standard Plumbing Code (NSPC). Plumbing fixtures should comply with the most current version of ADA.

The facility's plumbing system should be drained by gravity through soil, waste and vent stacks. Medical waste should be drained through corrosion resistant piping into either a local or centralized acid dilution tank.

2. Medical Gas Systems

The Nursing Home facility may be designed to accommodate either in-wall medical gases or portable equipment.

Individual facilities should match resident needs for medical gases with the quantities and locations of medical gases during equipment planning.

3. *Seismic (implications)*

Where required, earthquake resistant design should be used for plumbing and medical gas systems in accordance with current codes and standards.

1.3.6 Electrical

1. *Illumination*

Lighting should comply with the Illuminating Engineering Society (IES) recommended levels. Natural light should be maximized and artificial light should be adequate for residents and staff.

Resident rooms should have as much natural light as possible from the outside; oversized windows to increase natural light and provide a “healing” view should be considered. General lighting, night lighting, and exam lighting are needed. A reading light should be provided for each resident. Reading light controls should be readily accessible to residents.

A minimum of one night light fixture in each resident room should be controlled at the room entrance. All light controls in resident rooms should be inaudible.

2. *Power*

General purpose duplex receptacles are typically provided on each wall of a room or area. Resident rooms and toilet/showers should have duplex, grounded receptacles.

Dedicated duplex or special receptacles are provided for selected pieces of

equipment such as refrigerators, freezers and ice makers.

Staff work stations and other locations where personal computers (PCs) are used, are typically provided with multiple receptacles for the PC, monitor, printers, and other related electrical devices.

Junction boxes are provided for equipment requiring a hardwired electrical connection.

An emergency generator should be provided as an electrical source for power and lighting during an interruption of the normal electric supply. Duplex receptacles that are marked or colored should be provided to connect key pieces of equipment to the critical branch of the emergency power system.

3. *Security*

Security issues include the elopement of residents, particularly for special populations such as residents with dementia and/or Alzheimer’s disease. Urban and suburban sites with elopement issues should study delayed egress locking systems, if permitted by the authority having jurisdiction (AHJ).

4. *Life Safety*

The life safety program should provide a reliable system to protect building occupants, firefighting personnel, building contents, building structure and continuity of building function. The intent should be to provide an enhanced level of fire safety by reducing the probability of injury, loss of life or diminution of building function due to a fire. By limiting the development and spread of a fire emergency to the area of origin, the need for total occupant evacuation should be minimized.

Facility design aspects that relate to fire and life safety include:

- Structural fire resistance;
- Building compartmentalization
- Fire detection, alarm and suppression
- Smoke control and exhaust
- Firefighting access/facilities
- Emergency power

New Nursing Home construction and renovation of areas of existing facilities are required to be fully protected by an automatic fire suppression system. Efforts should be made to balance need for such systems while maintaining a residential environment.

The minimum width of corridors in areas used by residents is 96" [2440 mm]. Corridors and passageways that are not used by residents may be 44" [1120 mm] or wider.

Staff stations and areas used by residents are permitted to be open to the corridors in the latest edition of codes from NFPA and UBC.

5. *Energy Conservation*

Energy conservation is emphasized in all aspects of the building design. Refer to the most recent version of ASHRAE Standard 90.1, as well as DOE regulations.

1.3.7 Communications

1. *Telephone*

Unless restricted by the program of services, a telephone should be available at each resident's bedside. In addition, there should be one private telephone available per resident unit for

residents who do not subscribe to private telephone service.

Telephone outlets are typically provided at each staff work station or in each room.

Wall outlets are 18" [450 mm] AFF and desk outlets are 48" [1200 mm] AFF.

2. *Information Systems*

Information systems needs include computer and electrical outlets available at all work stations including decentralized charting locations. Desk or workstation outlets are 48" [1200 mm] AFF.

3. *Nurse Call*

A staff call system is provided for all resident rooms, toilet/showers, and other spaces used by residents. Specific needs for call system locations should be coordinated with the functional design of resident spaces.

Wireless technologies for staff should be studied, along with hard wired or integrated systems, to meet the needs of individual facilities.

4. *Television*

Cable and electrical outlets for television should be provided at each resident bed area.

5. *Public Address*

Public address systems are required for Nursing Home facilities for code required fire and life safety communications. The use of a public address system for regular paging or staff communications should be avoided in the Nursing Home facility.

1.3.8 Waste Management

1. Medical Waste

Medical waste is generated in medical exam rooms or in resident rooms where it is bagged, collected and transported using specially designated, closed containers to the soiled utility rooms. The waste is held there until it is transported via the loading dock to the medical waste handling facility.

2. General Waste

General waste is generated in all spaces and is held in waste containers for collection. It is then collected by cart and transported via the loading dock to the waste handling facility.

3. Recycling

Means of sorting, collecting, transporting and disposing of recyclable materials should be analyzed by locality and modified to suit local conditions and practices.

Optional use of disposable and recyclable products is an important design consideration in recycling alternatives that impacts physical space for waste disposal volumes.

4. Soiled Linen

Reusable soiled linens are generated in medical exam rooms and resident rooms. They should be collected in carts or hampers in the soiled utility rooms and transported to a soiled linen holding room near the loading dock for pick-up.

5. Utensils

Any washable items incorporated in the plan of care should be transported to the soiled utility room for sanitizing. Some items may be transported to a sterile

processing department or service for cleaning and reprocessing.

Disposable bedpans, urinals and emesis basins are a viable option due to low volumes in the Nursing Home facility.

6. Space Requirements

Space requirements for Waste Management will vary based on selection of waste collection and recycling methods. Space requirements need to be studied for each optional method or system considered.

1.3.9 Transportation

1. Residents

Residents typically arrive at the main entrance via private transportation. Some residents may arrive via ambulance at the ambulance entrance. The main entrance should have a covered drop-off area.

Residents are usually accompanied by family or other caregivers. Clear site and facility organization through the use of directional signage is required to assist in directing the resident and others to their destination.

Vehicles transporting residents for admission via the emergency entrance should be clearly directed to this location. Convenient access from visitor parking should be provided.

Features such as clear access routes, public spaces, landmarks and signage are particularly important in the Nursing Home to facilitate wayfinding.

2. Staff

Staff entry to the Nursing Home facility should be separated from other traffic such as resident/visitor and service. Staff facilities should be located convenient to staff entry.

3. Records

Resident medical and financial records are maintained centrally and may be distributed and accessed electronically.

4. Specimens

Specimens are collected on the resident units and are transported to an off-site, reference laboratory for processing and reporting.

Effective means are necessary for maintaining and transporting specimens to insure quality.

5. Pharmaceuticals

Pharmaceuticals including narcotics are transported by pharmacy staff to individual resident units in locked transport containers. Narcotics are delivered to a locked medication cabinet in the medication room.

6. Material

Supply traffic (material) should be separated from resident/visitor traffic.

Clean supplies are transported via supply carts to the clean utility rooms on the individual resident units where supplies are accessed by staff.

7. Linen

Supply traffic (linen) should be separated from resident/visitor traffic. Clean and soiled linen are transported in linen carts.

8. Sterile Supplies

Sterile items used in the medical exam rooms are transported via dedicated closed carts. Sterile items also may be stored in the clean utility rooms.

9. Food

Efficient, cost-effective and safe food production is based on a continuous system with specific methods for raw product flow, preparation, cooking, assembly and dispensing.

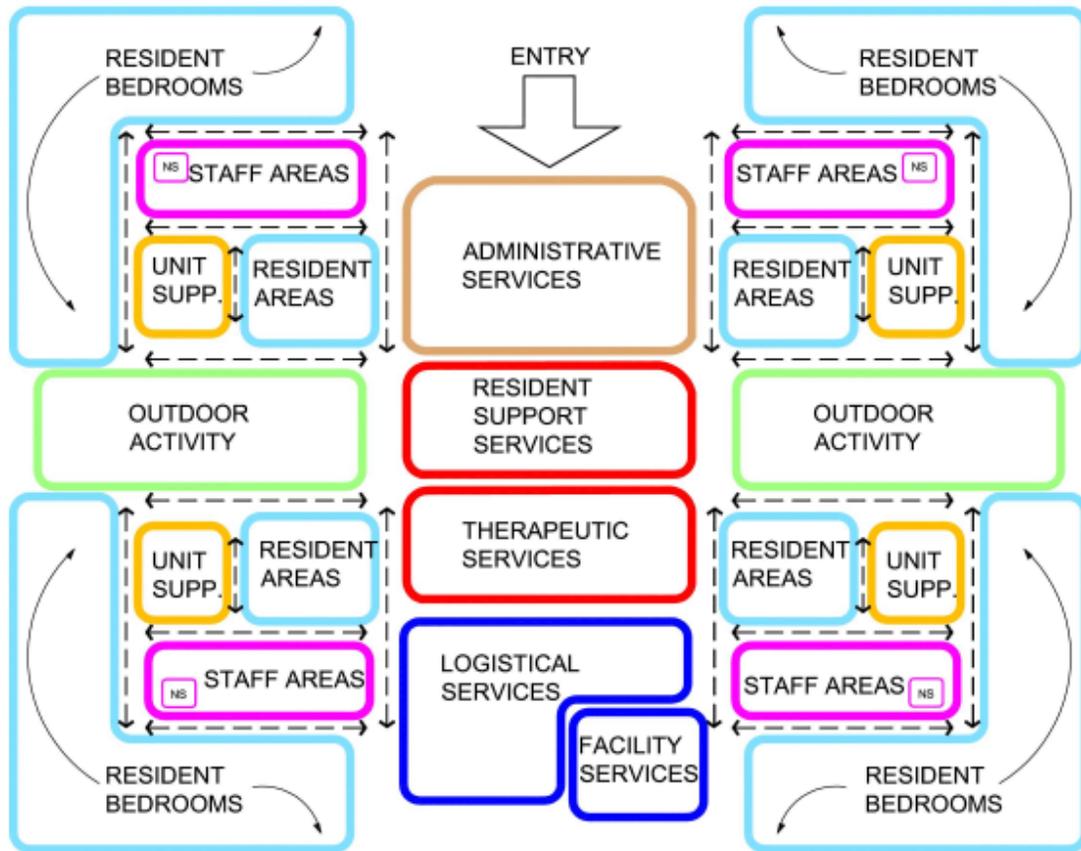
Clean and soiled areas and products must be segregated to prevent cross-contamination. Finished products should be transported only a short distance if they are to remain safe for consumption.

10. Waste

Waste is collected by environmental services staff and transported to soiled utility rooms on the individual resident units and trash collection areas near loading docks where it is disposed according to facility policies.

1.4 FUNCTIONAL DIAGRAM

See diagram below.



2.0 TECHNICAL CRITERIA

2.1 Codes and Standards

2.1.1 National Codes and References

The Department of Veterans Affairs requires consultants to use the latest editions of codes and standards for all projects. Among the required codes and standards are:

1. VA Directives, Design Manuals, Master Specifications and other guidance in the Technical Information Library (TIL)
<http://www.va.gov/facmgt/standard>.
2. *Occupational, Safety and Health Administration (OSHA) standards.*
3. *National Fire Protection Association (NFPA) codes.*
4. *National Electrical Code (NEC).*
5. *International Building Code, 2003 Edition (IBC 2003).*
6. *Uniform Building Code, 1997 Edition (UBC 1997), for other building elements.*
7. *National Standard Plumbing Code (NSPC).*
8. *Safety Code for Elevators and Escalators A 17.1*, published by American Society of Mechanical Engineers (ASME),
9. *Uniform Federal Accessibility Standards (UFAS)*, including Barrier Free Design Guide; A Supplement to the UFAS (DVA PG-18-13; February 1997).
10. *Building Code Requirements for Reinforced Concrete (ACI 318)*, published by the American Concrete Institute.
11. *Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings*, published by the American Institute of Steel Construction (AISC).
12. *Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings; Final Rule*, (mandatory for new federal buildings), Department of Energy (DOE) Regulations, 10 Code of Federal Regulations (CFR) Parts 434 and 435.
13. *Provisions for Construction and Safety Signs*, stated in General Requirements Section 01010 of the VA Master Construction Specification.
14. *Greening the Government through Efficient Energy Management – Executive Order 13123.*
15. *Greening the Government through Leadership in Environmental Management – Executive Order 13148.*
16. *Ventilation for Acceptable Indoor Air Quality – ASHRAE Standard 62-2001*, published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
17. *Safety Standard for Refrigeration Systems – ASHRAE Standard 15-2001*, published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
18. *Humidity Control Design Guide for Commercial and Institutional Buildings; Chapter 25: Eldercare Buildings - 2001*, published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

The current profiles of VA clients indicate that a high percentage of residents require assistance in activities of daily living such as toileting and showering. The VA *Barrier Free* supplement PG-18-13 establishes requirements, which differ from those of UFAS. The more stringent requirement is to be followed. It is recommended that Nursing Homes serving our nation's Veterans adhere to the requirements of PG-18-13, and provide accessibility in 100% of bedrooms and resident toilets designed to accommodate both male and female Nursing Home veterans.

VA Nursing Home clients include an increasing percentage of male residents who are larger and heavier than the smaller and female resident populations in most community Nursing Homes. Typical staff assisted activities for veterans, such as transportation, toileting, bathing, showering, and transfers to and from wheelchairs and beds, requires frequent use of lift devices.

Older VA residents may use toilets and wheelchairs differently than their younger and stronger counterparts. A departure from standard ADA and UFAS requirements regarding toilet and grab bar configurations and dimensions is therefore recommended. This will facilitate safe, staff-assisted transfers of residents in toilet rooms and similar locations. Older residents typically do not turn their wheelchairs in a circle. Residents are not successful in turning within a 5'-0" diameter circle. A 5'-6" minimum clear area is recommended.

This Design Guide recommends departures from the ADA, UFAS and VA PG-18-13 standards regarding transfers

to toilets. The VA has initiated discussions with the staff of the Access Board regarding modifications of the ADA and ADAAG design guidelines, in an effort to accommodate staff-assisted activities in Nursing Homes and similar care giving facilities.

2.1.2 Local Codes and References

VA is not subject to local imposition of code enforcement procedures, such as drawing reviews, building permits, inspections, fees, etc. Therefore, VA functions as the Authority Having Jurisdiction for all VA facilities and projects. SVH's and other Nursing Homes serving United States Veterans are not VA facilities and must comply with local codes and enforcement procedures.

2.1.3 Other Recommended Reference Standards

The following consensus documents provide additional guidance and useful insights into the minimum functional requirements of Nursing Home design:

1. Guidelines for Design and Construction of Hospital and Health Care Facilities, 2001 Edition (Guidelines 2001), published by the American Institute of Architects Academy of Architecture for Health and the Facilities Guidelines Institute, with assistance from the U.S. Department of Health and Human Services.
2. Recommended Practice for Lighting and the Visual Environment for Senior Living, (IESNA RP-28-98), published by

the Illuminating Engineering Society of North America (IESNA), and adopted as an Approved American National Standard (ANSI RP-28-2001).

2.1.4 OBRA 1987/NHRA

The Nursing Home Reform Act (NHRA) of 1987 (PL 100-203) was an outgrowth of the Omnibus Budget Reconciliation Act of 1987. OBRA 1987 probably has had more impact than any other single piece of legislation regarding Nursing Homes in the United States as well as the culture and philosophy of caregiving within them.

NHRA guaranteed Nursing Home residents certain rights and protections, including, but not limited to:

- Access to all of the nursing and rehabilitation services offered by a facility that may be needed to enable a resident to attain his/her highest practical level of independence and physical, mental and psycho-social function
- Development of an on-going program of care and activities designed to meet the specific needs and interests of each individual resident
- The right to participate and/or be represented in care planning, along with certain rights of privacy and dignity
- The right to be free from physical and chemical restraints.

The immediate effect of NHRA/OBRA '87 was the changes in state codes and regulations designed to incorporate the NHRA requirements into state Medicare and Medicaid reimbursement policies.

Additionally, there were gradual changes in minimum space standards. NHRA initiated an evolution of stronger social, recreational, rehabilitative and meaningful activities programs such as:

- Personalization of rooms and the development of "homelike" residential environments,
- Better food service programs,
- Recreational activities and wandering gardens,
- Expansions of physical and occupational therapies, activities of daily living and dementia programs,
- The incorporation of engaging environmental stimuli, and
- The recruitment of volunteers, families and other residents in stimulating daily experiences.

2.1.5 HIPAA

The Healthcare Insurance Portability and Accountability Act of 1996 (HIPAA) has reinforced and extended NHRA emphasis on privacy and dignity, to include audible as well as visual privacy. This is especially the case with respect to protection of each individual's medical records, private information and communications. This law protects all conversations between residents and admission interviewers, caregivers, nurses, physicians and families. Serious breaches of those rights to privacy are subject to Federal litigation.

HIPAA is currently having an impact on the design of resident rooms in terms of audible privacy in standard two-person room layouts where only a cubicle curtain separates resident beds. Resident unit layouts now consider the juxtaposition of rooms and spaces, which may limit sounds of private

conversations from being overheard. Planning of staff stations, reception desks, conference rooms, offices, treatment and therapy rooms, where exposed private records may be seen and conversations overheard by unauthorized persons, should also consider privacy during design

2.1.6 Life Safety

Successful strategies have long been available for making a sprinkler system inconspicuous. However, in new construction, achieving “homelike” residential environments remains a significant challenge when attempting to incorporate fire safety and egress provisions required for Nursing Home occupancies under contemporary codes.

Nursing Home life safety issues that require attention include evacuation standards and disaster planning. Among them are the following:

1. Evacuation Standards

Eighty percent of Nursing Home residents may suffer from some degree of dementia. Those who may be so afflicted can become frightened and confused if awakened by an evacuation alarm in the middle of the night. Given the limited staff that may be available to assist residents on some shifts, vertical evacuation from even one floor above grade may simply not be practical. Many people prefer to depend upon horizontal Nursing Home evacuation plans.

For some Nursing Home administrators, this means building only single story Nursing Homes, or perhaps a two-story building built on a hillside in which each

floor may exit on grade. Multi-story buildings must consider planning for horizontal evacuation to a safe area of refuge. This includes:

- Planning the facility so that each floor is divided into at least two compartments separated by a rated firewall. The firewall extends throughout the full height of the building.
- Openings in this firewall are strictly limited to ducts equipped with automatic fire dampers and horizontal exits across corridors.
- Doors opening in opposite directions in egress corridors are recommended so that occupants in either smoke compartment may safely exit to an area of refuge on the other side of that wall.
- A fully sprinklered building where each smoke compartment has at least two other means of egress.
- An area of refuge on each side of the firewall sized to accommodate the entire adjacent zone population that could be present on the other side of the barrier.

Elopement of dementia residents whether deliberate or accidental, can threaten the resident’s health and safety, and represents risk for any Nursing Home. Suburban and rural sites may present opportunities for keeping such a resident safely contained within a controlled perimeter such as a wandering garden. An urban site and many suburban sites may not offer such an opportunity. Many Nursing Homes prefer to restrict travel out of a dementia unit by using a delayed egress locking system. Such systems will typically open immediately in response to a staff member having a

key, or by pressing a code on a key pad. Most of these systems also will respond to a resident attempted departure after 15 seconds of continuous pressure on the exit door, by which time alert staff should be able to respond to the alarm in the event of an unauthorized exit.

The 2003 Edition of the IBC states that resident units may not be locked-down for any reason, regardless of the circumstances. Thus, delayed egress locking systems are not permitted in states, which have adopted IBC 2003.

2. Disaster Planning

Situations can arise in which it may not be feasible to evacuate residents for days, weeks, or months. In those cases, emergency power will be required to maintain food service, heating, ventilating and vertical transportation systems, and life safety systems. This is especially important to keep a frail resident population reasonably comfortable and safe. This Design Guide recommends that the project consider planning for this contingency in order to care for the veteran population especially when the facility is located in an area where a high probability of threat exists from natural disasters such as hurricanes and earthquakes.

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2.2 Site Considerations

2.2.1 Introduction

Site analysis and planning are influential to the success of a project. At the beginning of the design process, the design team should perform several preliminary analyses that will affect the final design of the facility. Several of the site related factors that are required for a Nursing Home care facility are mentioned in this section and are to be considered as essential tools for planning of a Nursing Home facility. Each project designer should consider the project specifics that include, but are not limited to:

- Site Area
- Site Geometry
- Local Zoning
- Topography
- Regional and Climatic Factors
- Utilities
- Other Site Characteristics

2.2.2 Planning

When planning a Nursing Home facility, consider the activities of the multiple users including the residents, staff, visitors, maintenance personnel, service providers, emergency crews and utility workers. The completed site should include:

- Landscaped Features
- Wander Garden
- Setbacks and Buffers
- Ample Parking for Staff and Visitors
- Access for Emergency Vehicles
- Utility and Service Access
- Covered Entry
- Signage - Wayfinding

To provide adequate planning and programming guidance, 12 study sites were reviewed for essential characteristics. The study sites varied in area, number of stories, unit size and number of beds.

1. Generic Site Plan

The generic site plan provided in this section (Figure 2.1) indicates a hypothetical solution for a 120 to 160 bed Nursing Home facility. The projections and assumptions for this plan are for reference purposes only, and are not meant to suggest a solution for a specific design problem. Features of this Generic Site are similar to those mentioned in this section.

The generic site plan illustrates:

- Single Story footprint
- Approximately 120-160 Beds
- Expansion potential could accommodate an additional 80 beds +/-

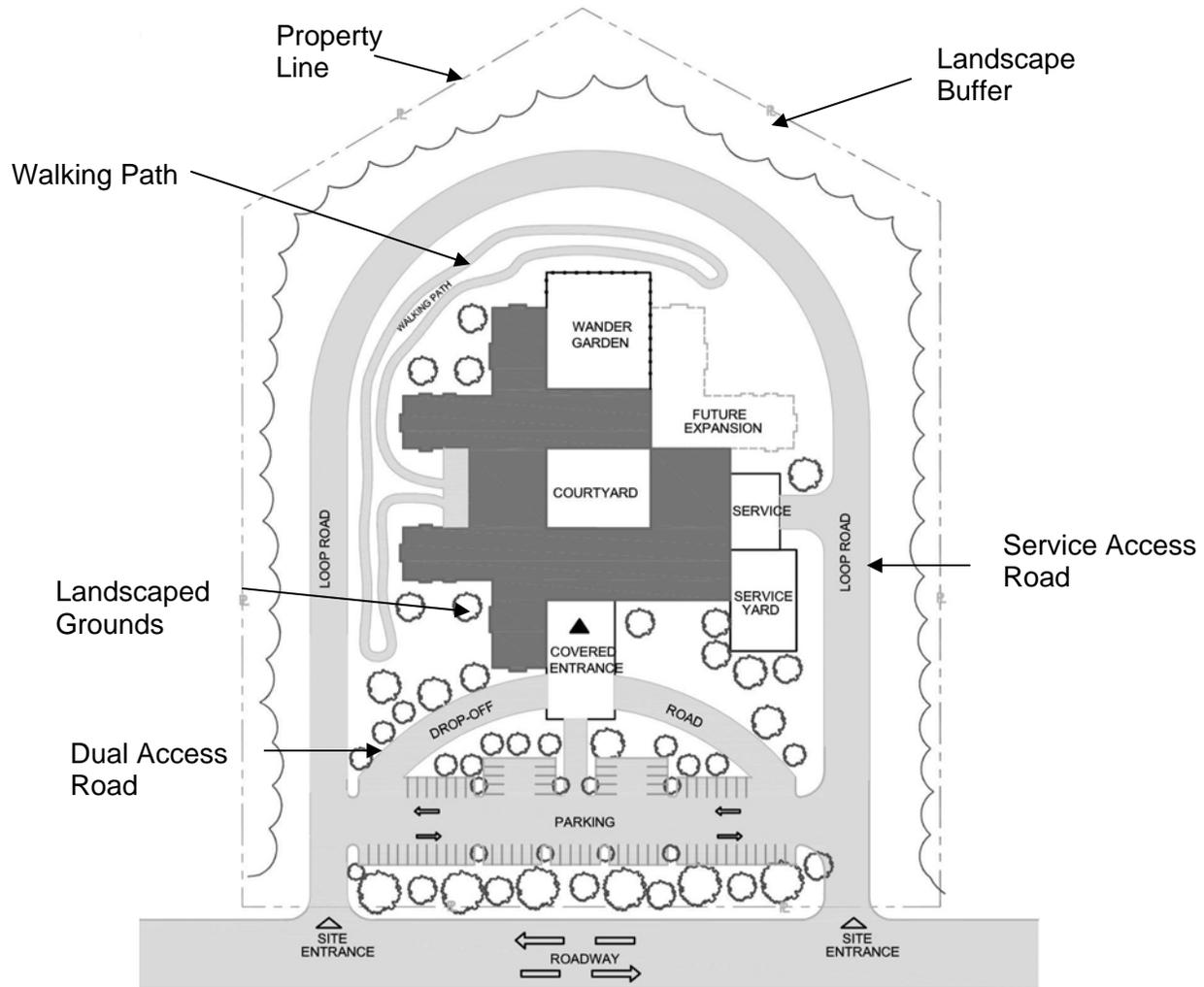


Figure 2.1

Generic Site Plan
NTS

2. Parking

The residents of Nursing Home facilities do little driving; therefore, the requirements for parking are generated by staff, visitors, service technicians and deliveries.

Table 2.1 lists data related to peak periods of 2pm to 4pm on a weekday. Site planning concepts for parking as indicated in Table 2.1 are based on Land Use: Section 620 Nursing Home, taken from the Institute of Transportation

Engineers (ITE). The table suggests an average of .37 parking spaces per bed during peak hours between 2 pm and 4 pm for visitors. The ITE review of their study sites indicates an average of 1.5 spaces per 1,000 sf for a Nursing Home facility. The number of beds, the number of staff, and the size of the facility all play a role in adequately sizing a parking area for a Nursing Home facility.

Statistic	Peak Period Demand
Peak Period	2:00 – 4:00 p.m.
Number of Study Sites	6
Average Size of Study Sites	160 beds
Average Peak Period Parking Demand	0.39 vehicles per bed
Standard Deviation	0.18
Coefficient of Variation	46%
Range	0.12 – 0.62 vehicles per bed
85 th Percentile	0.52 vehicles per bed
33 rd Percentile	0.35 vehicles per bed

Table 2.1
Parking Demand Table - Weekday

Parking Generation, 3rd Edition, 2004
Institute of Transportation Engineers

2.2.3 Topography

Topographical influences may effect the orientation of access points to the facility such as entrance, service, egress, parking, perimeter road for emergency, retaining walls, berms, landscaping and general location of the structure on the site (See Figure 2.2). During the planning phase of the project, consider what the impact of the topography of the site will have on the design. Walks, ramps, outcroppings and roadways are also features that are impacted by site topography. (See Figure 2.3) During the initial survey of the site, a physical

review of the site is recommended (See Figure 2.4). Large rock outcroppings could influence landscaping on site as well as the location of the facility on the site. Consider using major outcroppings as a landscaping feature on the project site.

Where possible, at-grade site access from the facility is desired. Existing on-site grading is an important consideration when planning and locating the access points of the facility.

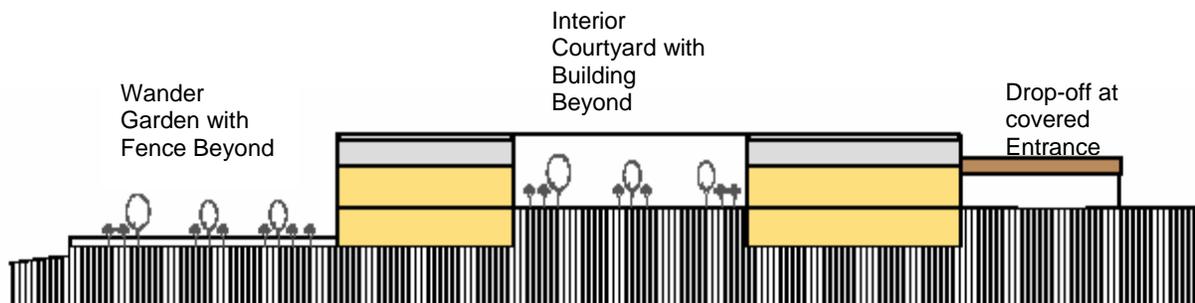


Figure 2.2

Generic Site Section: Multi-level Facility with Variation in Topography

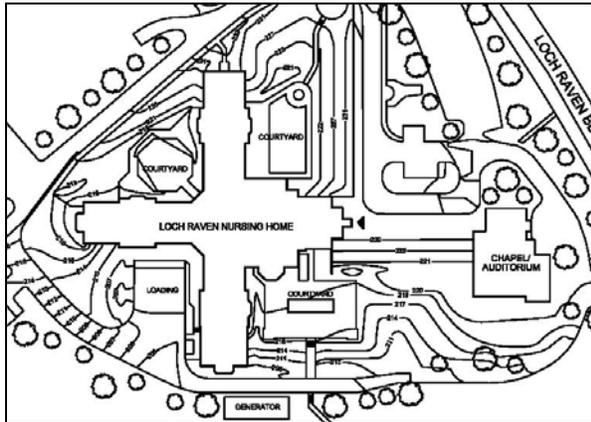


Figure 2.3

**Nursing Home Care Unit at Loch Raven
Baltimore, MD**



Figure 2.4

**Aerial Photo
Washington State Veterans Home
Retsil, WA (During Construction)**

2.2.4 Zoning

Unlike many general aspects of site design such as roadways and parking aisles, zoning is site specific. Preliminary plans should not advance without performing a zoning analysis. In the case of government-owned property, it is important to consider the zoning and

adjacencies for compatibility with neighboring buildings. Factors for zoning include:

- Height
- Lot Occupancy
- Number of Stories
- Parking
- Green Space
- Historic District
- F.A.R.
- Setbacks
- Use Groups

2.2.5 Historic Features

Early in the design phase, there should be an analysis, which determines whether there are any historic issues. As with the zoning analysis, the historic related issues and features are site specific. The impact of historic related issues includes: finish of the exterior; window types, colors and shapes; roof types and slopes; color of façade; height of facility and location of facility. Federal, state and local jurisdictions and related agencies should be contacted to assure that the guidelines in place are followed. In Figure 2.5, the Forwood building directly affected the window shape and size; the axis and shape of the King Health Center, US Soldiers and Airmen’s Home in Washington, DC. The site plan in Figure 2.8 illustrates the axis and geometric impact of the Forwood building on the US Soldiers and Airmen’s Home.



Figure 2.5
Forwood Building, US Soldiers and Airmen's Home

2.2.6 Roadways

1. Site Access

Site access roadways may be located directly at main public roadways. The location of curb cuts and aprons should be planned in accordance with local zoning code or AHJ.

2. On-Site Roadways

Width of roads should accommodate traffic in each direction. (See figure 2.6) A path from the site entrance to entry of the facility should be logical and easily identifiable.

Site roadways to and from parking areas should be capable of accommodating two-way traffic. Proper signage and direction arrows may enhance clarity of destinations and paths.

3. Emergency Roadways

Emergency access is required on the grounds of the facility. This access relates to ambulance, fire and rescue, law enforcement and other emergency related vehicles. The width of the roadway for emergency purposes should be maintained and unobstructed at all times.

A loop road or some means of complete site access is generally required in every jurisdiction. Loop road design should accommodate a fire truck, and enable emergency vehicles to access a complete revolution around the facility. At a minimum, access to every part of the site and facility for emergency vehicles must be provided.

4. Service Road

The service road may better serve the facility by having a separate access point. Should that not prove feasible due to site restrictions or other reasons, consider a separation of roadways upon entry to the site. Clearly indicate the service road and design it in such a way as to not interfere with general site access or emergency roadways. The service roadway should accommodate truck traffic in two directions unless the roadway system is designed and clearly identified as a one-way traffic pattern.



Figure 2.6
Service Road
Nursing Home Care Unit at Loch Raven, Baltimore, MD

2.2.7 Site Signage/Wayfinding

Locate signage on the site for visitors, staff and service accommodations. Some suggestions for site signage include:

- Directional Traffic (one-way)
- Restrictions
- Parking
- Deliveries
- Passenger Pick-up
- Entrance to Site
- Entrance to Facility

2.2.8 Proximity to Adjoining Facilities

Several Nursing Home facilities are affiliated with Federal or state medical center campuses. In either case, the foregoing topics are considered issues for site planning and design. Site access and roadways of an adjoining existing medical center are examples where a new Nursing Home facility may be able to utilize in-place vehicular pathways. (See Figure 2.7)

Adjoining or proximate facilities may influence or determine certain characteristics of the new facility.



Figure 2.7

Proximity to Existing Facilities
 (View from Loading Dock)
 State Veterans Home at Montrose

2.2.9 Shared Amenities

The nature of the site with respect to location and co-existence could influence several aspects of a facility. Shared amenities, for example, could impact:

- Siting of facility
- Orientation of entrance
- Location of services
- Access to site
- Availability of utilities

If physically affiliated, this physical connection may require the use of a common service road or a common entrance to the site in general. (See Figure 2.8 and 2.9) Independent access to power, communications, gas, water and other utilities is preferable, thereby enabling the facility to remain on line in the event of outages on the shared campus. Emergency power provisions for the facility should be a part of the planned program due to the needs of the residents.

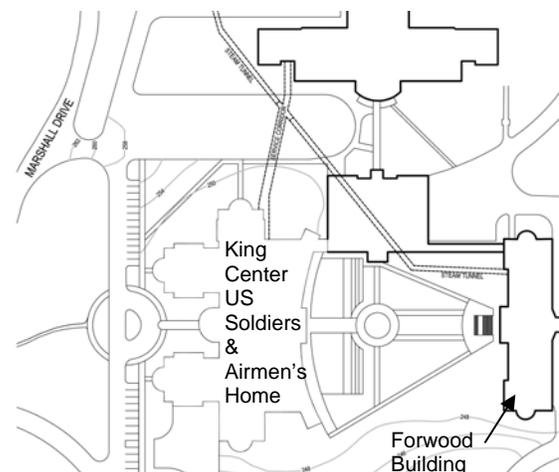


Figure 2.8

Shared Amenities
 U.S. Soldiers and Airmen's Home,
 Washington, DC

The advantage of sharing campus amenities include, but are not limited to:

- Access to site
- Services and utilities
- Possibility for use of existing on site features
- Existing buildings
- Medical facilities
- Outdoor amenities

Many of these items translate into cost savings over the life of the facility. These and other shared amenities significantly affect project costs.

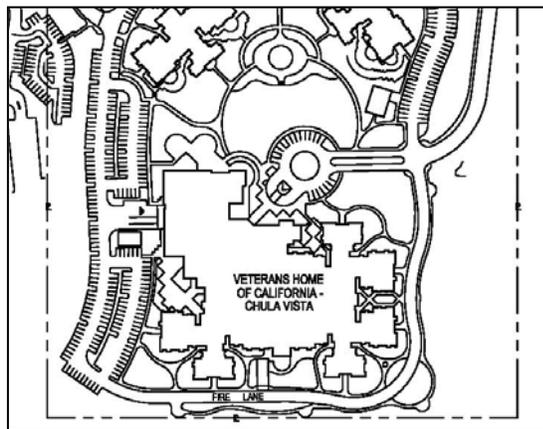


Figure 2.9

Parking and Roadways
Veterans Home of California at Chula Vista

2.2.10 Utility Access

Site utilities are critical to successful operations. Among the utilities or utility related components requiring site accesses are:

- Electrical service transformers
- Communications services
- Gas lines
- Stormwater management
- Water and sewer utility
- Oil service (if applicable)

- Emergency power (including fuel)
- Power and communications

Where possible, dual feeds for some utilities should be provided. The most pronounced of these would be power sources. An attempt should be made to attain a feed to the facility from different substations.

2.2.11 Services

Services as referred to in this section include, but are not limited to:

- Loading docks
- Shipping/receiving areas
- Morgue service areas
- Trash areas
- Vehicular turnaround roadways
- Service ramps

The services for Nursing Home facilities are a major component of day-to-day operations. The location of the services are not to conflict with the main entrance to the facility. (See Figure 2.10)



Figure 2.10

Site Service
State Veterans Home at Fitzsimons,
Colorado

2.2.12 Landscaping (Natural & Designed)

1. Natural Features

Landscape features provide a major service to any site or campus. Natural features may include:

- Rock outcroppings
- Water features (lakes, streams, ponds, etc.)
- Trees
- Fields

Where possible, these features should be considered during the building and site design phases of the project. Just as a designer considers the topography during the planning phases, so should the natural aspects of a site be considered.

2. Designed Features

Designed features that relate to the site include:

- Trees
- Shrubs
- Grass
- Stone treatments
- Gardens
- Fountains
- Fences
- Plazas

While planning for the landscaping of the site, consider indigenous vegetation whether introduced or replaced because of the project. For special populations such as veterans and dementia residents, plants or shrubs that are free of risk due to accidental ingestion should be considered. Additional considerations include requirements of a shared site or other site-specific covenants that may affect the design.

2.2.13 Covered Entry

As part of the building and site design, provisions for a covered entrance at the primary access point to the facility are recommended. Provide enough covered area to accommodate two vehicles, one behind the other. The width of the roadway or motor court under the covering also should be designed to accommodate an accessible van to park at the entrance while allowing a vehicle to pass. It is not uncommon for emergency vehicles to access a Nursing Home site. Therefore, height of covered entrance is to be designed to allow clearance for large emergency vehicles.

The covered entrance is also an area where visitors and residents may relax and sit. Ample space should be planned and provided for seating and circulation near the entrance to the facility. (See Figure 2.11)



Figure 2.11

Covered Main Entrance

Nursing Home Care Unit at Loch Raven

2.3 Perception and Interiors

2.3.1 Introduction

The Nursing Home facility is considered a residential, “home-like” environment rather than a medical center. When designing interiors of the Nursing Home facility, include considerations for:

- Interior Finishes
- Colors
- Spatial Relationships
- Size of Spaces
- Exterior View
- Exterior Access

These are important aspects of the residential environment where individuals are indoors for extended periods of time. Designers should minimize travel distances between residents’ bedrooms, dining, recreation and lounge areas. Where shortened distances are not possible, provide handrails, and rest stops with convenient seating or other physical supports along an extended travel route.

2.3.2 Perception

Individual perception differs according to the social situation. In a Nursing Home facility, the creation of a home-like, healing environment can greatly improve the resident’s perception of their overall well being and sense of control over their environment. Perception is not based upon isolated responses to a particular stimulus, but rather as a reaction to the total stimulus field. When designing the interior of this building type, thought should be given as to how the proposed solution will be experienced by its user; for example:

- A dark border may be perceived as a drop-off and should be avoided.
- A toilet in stark contrast to the floor is perceived as a separate entity rather than a large field of a single surface.

Perception of space is based upon the use of cues that normally associates distance in our daily life. Many of these cues are developed at an early age in life and typically do not change as an individual ages. Examples of perception and relationships include:

- Familiar behavioral settings
 - Lounge Area
 - Living Room
- Sociopetal space and furniture
 - Clustered seating
 - Newspaper and magazine racks
- Get-Away Spaces (See Figure 2.12)
 - Outdoor Nature settings
 - Benches and pathways near water or of feature in a courtyard or garden



Figure 2.12

Outdoor Gathering Space
CO State Veterans Home
Fitzsimons, CO

- Family Spaces
 - Room with fireplace
 - Home-like arrangements
- Intimate Spaces
 - Tables and chairs on a balcony
 - Benches with a view
- Views to Exterior
 - Large windowed walls
 - Indoor/Outdoor areas (balconies, screened porches)
- Enhancing self-esteem
- Maximized independence
- Staff competencies
- Welcoming relatives into the facility
- Involvement of local community
- Provision of Wayfinding and orientation
- Meaningful use of time

2.3.3 Design and Dementia Care

Dementia is a general term indicating changes to a cognitive function that result from a range of specific, usually progressive and irreversible disorders of the brain. The most common of these disorders is Alzheimer's disease. Symptoms related to Alzheimer's include:

- Short term memory loss
- Difficulty in spatial perception
- Difficulty planning activities
- Lower thresholds for stress
- Behavioral Impairment
- Wandering behaviors

Dementia residents may remain at the Nursing Home for extended periods. A design that reflects sensitivity to the needs of the dementia population at a Nursing Home will have a positive impact on the residential environment.

1. *General Design* - The acknowledgement of the critical, functional issues is the first step towards a proactive approach in designing for dementia care in a residential facility. There are certain principles to consider when designing for the accommodations of the dementia resident. Planning considerations include:

- Reinforcing personal identity

A unit that is designed for a dementia populace should serve to compensate for the effects of dementia and reinforce the skills and functions that remain.

These features include:

- Designing for a "Healing Environment".
- Inclusion of generic, familiar activities
- Safety features that are not imposing (wander guard)
- Safe outdoor space
- Use of physical objects rather than color for recognition
- Limited size in the unit
- Noise control
- Enhancements of visual access
- Signage and Way Finding tools or cues

2.3.4 Lighting

Regardless of one's age, lighting plays an important role in the ability to perceive and discriminate light, color, contrast and textures. As one ages, the capacity diminishes and items that were once clear to see now seem fuzzy or unrecognizable. An inability to accurately judge color in interior environments can result in disorientation, accidents, and reduced efficiency in completing tasks, overall discomfort or ill health. The following sub-sections relate to the natural and artificial lighting considerations for the design of a Nursing Home facility:

1. Natural Light (Daylighting)

Daylight is the standard against which the human mind measures all things seen. Colors seen with daylight will appear real and appropriate through color constancy. The color produced by daylight will vary from dawn, to noon, to dusk. Color reflection from adjacent surfaces will vary as well. Strategies and elements of daylighting should be included in design. (See Figure 2.13) Daylighting is not an afterthought or a simple matter of applying some shading controls to the windows. Many factors are involved with the use of daylight in buildings:

- Aesthetics
- Psychological response
- Health
- Energy/Cost
- Percentage of window area
- Placement of window
- Orientation



Figure 2.13

Daylighting in a Resident Bedroom

Veterans Nursing Home
Fitzsimons, CO

Specific goals related to daylighting of buildings may be stated in simple terms:

- Design to achieve daylight in all feasible areas in significant, useful quantities.
- Distribute daylight reasonably uniformly, with no significant dark spots.
- Avoid allowing direct sunshine into the building interior in such a way that it may cause visual discomfort or visual disability. Assess the design for all possible sun penetration angles.
- Provide daylight sensitive controls for the electric lighting so that it will be dimmed or turned off when not needed.

2. Artificial Lighting

When measuring the effectiveness of artificial light, there are generally two scales by which this is done: the Color Rendering Index (CRI) and the Correlated Color Temperature (CCT). The CRI indicates how precisely a specific source of light can show an object in relationship to its true color. (See Table 2.2) The CCT describes the degree to which a color appears warm (reddish), neutral or cool (bluish) and is measured in degrees Kelvin (K). Well-saturated colors are best for environments used by the aging especially if color is being used as a directional tool or to enhance safety. (See Figure 2.14) An example would be the use of color to highlighting a change in floor level or designating an exit as the CCT of light sources has been found to increasingly influence color perception.



Figure 2.14

Use of Artificial Lighting in a Resident Bedroom

New York State Veterans Home

Montrose, NY

The following illustrations demonstrate the effects of artificial lighting on a plane of interest and the various solutions available:

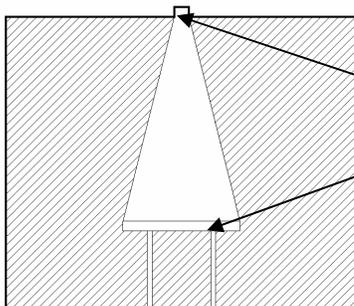


Figure 2.15

Overhead Downlighting – Low Intensity

Overhead Downlighting is effective for task-oriented activities such as those found in occupational therapy. This lighting technique will allow the individual to focus on that surface, either a table or a wall.

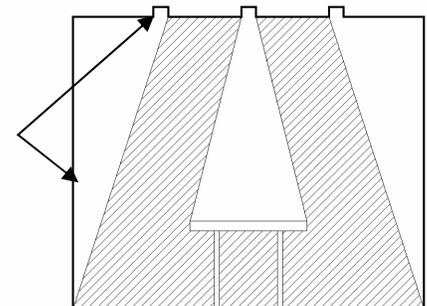


Figure 2.16

Overhead Downlighting with Lighted End Walls

This lighting technique allows a greater amount of illumination over a greater surface area.

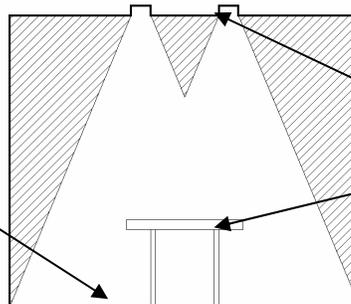


Figure 2.17

Overhead Diffuse – High Intensity

Overhead Diffuse lighting is effective in group activities such as dining and card playing.



Color Temperature (K)	Applications
2500	Bulk industrial and security lighting
2700 - 3000	Low light levels (10 fc); General residential lighting, hotels, fine dining and family restaurants, theme parks
2950 - 3500	Display lighting in retail and galleries; feature lighting
3500 - 4100	General lighting in offices, schools, stores, industry, medicine; display lighting; sports lighting
4100 - 5000	Special-application lighting where color discrimination is very important (uncommon for general lighting)
5000 - 7500	Special-application lighting where color discrimination is critical (uncommon for general lighting)
Minimum Lamp CRI	Applications
50	No critical industrial, storage, and security lighting
50 - 70	Industrial and general illumination where color is important.
70 - 79	Most office, retail, school, healthcare and recreational spaces.
80 - 89	Retail, work, and residential spaces where color quality is important
90 - 100	Retail and work spaces where color rendering is critical
Table 2.2 Color Classification Of Light Sources	

2.3.5 Contrast and Glare

The quality of lighting can be judged through two primary characteristics: contrast and glare. Contrast is necessary for good visual perception. It is also possible to produce excessive contrast, which impedes good visual response. Therefore, luminaries and light fixtures need some type of shielding device to prevent a direct view of the lamps.

Glare is usually associated with brightness differences or with reflected light. It is not recommended that luminaries be placed on the ceiling unless properly shielded with a lens, diffuser or shading device. Windows should generally be located to the resident's side to produce good quality task light without veiling reflections.



2.3.6 Physiological and Psychological Benefits

Interior design for Nursing Home facilities present a wide range of color problems due to the different needs of residents, visitors, doctors, nurses and other staff and the varied nature of specific spaces. The goal is to design a typical resident environment as a place where hospitality is the emphasis. During design, consider the following:

- Loss of balance
- Cognitive impairment
- Visual impairment
- Hearing impairment
- Increased sensitivity to temperature and direct sunlight.

Physiological and psychological design considerations include:

- Avoiding excessive direct natural light
- Providing visual flexibility such as adjustable lighting, blinds and shades;
- Introducing stimuli through lighting;
- Providing natural lighting;
- Using broad horizontal windows
- Avoid narrow vertical windows;
- Using 20 to 30% of the exterior wall as window area;
- Providing views with natural and synthetic elements.

2.3.7 Acoustics/Noise Control

If handled improperly, acoustical design in a Nursing Home facility can affect the resident's ability to hear and be heard. This may also cause the residents social discomfort, contributing to fear, embarrassment, depression, or isolation. Introduce sound absorption materials or

compartmentalization in the plan. The latter may afford an enhanced sense of privacy in the two bed room prototype.

Two types of noise that disrupt residents include:

- Sound from inside their rooms, such as a roommate snoring or listening to a loud television program,
- Sound generated from the outside, such as carts rolling down the hall.

2.3.8 Interior Finishes

Consider the following few key factors in the design process. These considerations have an impact on the built environment and the life cycle costs of the facility. The factors include:

- Maintenance,
- Durability,
- Affordability,
- Texture,
- Therapeutic attributes.

Additionally, designers should specify special coatings on fabrics and moisture resistant backings. Consider testing all product colors and textures for its perception and psychological impact within the Nursing Home environment. There are various aspects of an aging population that influence design of interior finishes and furniture selection. Examples include dementia and incontinence.

Creating a 'Healing Environment' that supports health is essential to quality patient care. (See figures 2.18 and 2.19) Factors that can assist in creating this environment include:

- Soft colors
- Warm finishes
- Music
- Healing gardens



Figure 2.18

Main Lobby Wall Aquarium
New York State Veterans Home
Montrose, NY



Figure 2.19

Front Lobby
Western Kentucky Veterans Center
Madisonville, KY

1. Floors

To minimize the number of falls and cushion them when they do occur, consider using continuous, slip resistant and resilient flooring materials, such as sheet rubber or vinyl with welded joints,

in resident toilet rooms and showers, in lieu of harder and sometimes uneven surfaces such as ceramic tiles with grouted joints. Carefully selected and appropriately specified carpeting materials used in lieu of harder surfaces may also minimize injuries due to falls in resident rooms and unit corridors, especially when recessed flush with adjacent flooring materials. Consider the following when choosing a flooring material in Nursing Home facilities:

- Readily cleanable surfaces
- Water resistance in food consumption and preparation areas
- Being physically unaffected by germicidal cleaning solutions.

Avoid or minimize slippery floor surfaces, area rugs, and abrupt changes in flooring materials without tapered thresholds or nosings. (See Figure 2.20) Reflective, glossy floors are to be avoided for a number of reasons. Beside the obvious fall hazard it presents, for those residents with vision degeneration diseases and depth perception issues, this finish can easily deceive the elderly population and cause unwanted behavioral and management problems. There are numerous low-luster resilient floorings available, with VCT (vinyl composite tile) being the preferred solution due to its cost and maintenance ease when replacement is necessary.

Consider carpet density when selecting it as a floor covering. Carpet density is the amount of pile yarn in unit volume of the carpet. This number translates into a “carpet traffic classification” which ranges from:

- I (light)

- II (Heavy)
- III (Extra Heavy)

The above classifications fluctuate according to use. In a Nursing Home environment, the resident room is considered Class II, while the staff station and corridors are considered Class III. The transition of finishes must be considered. (See Figure 2.20)



Figure 2.20

Finish Transition from Resident Area to Corridor

State Veterans Home at Fitzsimons, Aurora, CO

The following are the top 10 specified materials in the healthcare industry listed in order of preference. Refer to item 2.3.9 for specific benefits:

- VCT
- Sheet vinyl
- Broadloom carpet
- Vinyl-backed carpet
- Ceramic tile
- Carpet tile
- Vinyl plank flooring
- Linoleum
- Rubber flooring
- Poured flooring

Each of these products are viable choices, but consider these

recommendations when designing interiors:

- *Resident Rooms*
Sheet vinyl and VCT
- *Resident Bathrooms ; Tile to Carpet*
(See Figure 2.21)
Ceramic tile and sheet vinyl
- *Public Spaces (wall base)*
Rubber cove base, vinyl cove base, and stain grade wood base in oak, maple and cherry



Figure 2.21

Pattern and Surface Choices at Bathing Area

*US Soldiers and Airmen's Retirement Home
Washington, DC*

2. Walls

Walls are not seen only as a form of enclosure and privacy, but also as a form of support and guidance. The elderly often support themselves by holding onto the walls while performing their daily activities. Certain materials, textures, and colors should be encouraged while planning the interior design of the facility. Consider the following:

- *Resident Rooms (wall finishes)*
Water/latex-based paint, Type II vinyl wall covering, rigid vinyl sheet/corner guards, wall covering borders

- *Public Spaces (wall finishes)*
Type II vinyl wall covering, water/latex-based paint and rigid vinyl sheet and corner guards or Type I vinyl wall covering, plaster/sheet corner guards.

3. *Doors and Hardware*

Door hardware for this building type is unique because the residents include people who are aged, infirmed, sick or disabled. Nursing Home residents need to operate hardware with the least amount of effort.

4. *Ceiling Material and Height*

When choosing a ceiling material and height, consider the use of the space and the intended user. (See Table 2.3) The materials commonly specified are gypsum wallboard (GWB) and acoustical ceiling tile (ACT). In keeping with the common goal to present a healing, comfortable environment for the resident, painted gypsum board ceilings are recommended. If budget is a defining factor in ceiling selection, (ACT) may become the default solution.

Consider the following ceiling heights when designing for the residents of a Nursing Home facility:

Room/Space	Suggested Minimum Heights
Resident Room	9'-0"
Corridors	9'-0"
Activity Areas	10'-0"
Dining	10'-0"
Resident Toilet/Shower	8'-0"
Table 2.3 Recommended Ceiling Heights	

2. *Seating Patterns and Fabric*

The following materials are the recommended choices for Nursing Home care environments:

- Woven Crypton,
- Vinyl
- Solution-dyed fabrics

Refer to Figure 2.22 for pattern examples of resident bedroom armchairs, and Figure 2.23 for resident dining room seating.



Figure 2.22

Examples of Resident Bedroom Seating
(Arm type chairs are good for NHCUs)



Figure 2.23

Examples of Resident Dining Seating

2.3.9 Characteristics of Floor Finishes

Due to the long term nature of the Nursing Home facility, finish selections play important role in establishing a "home-like" setting. While aesthetics are significant, maintenance also must be taken into consideration. The finish types that follow illustrate some of the characteristics to consider when planning the interior designs and furnishings for a Nursing Home facility.

1. *Carpet*
 - Aesthetically pleasing
 - Durable
 - Ease of maintenance
 - Wheelchair access
 - Acoustics
 - Availability of vinyl backing to provide moisture resistance
2. *Sheet Vinyl Flooring*
 - Infection control
 - Aesthetics
 - Moisture barrier
 - Usually complies with health department regulations
3. *Vinyl Composite Tile (VCT)*
 - Low Initial cost
 - Durability
4. *Vinyl Wall covering*
 - Aesthetics
 - Durability
 - Wheelchair access
 - Infection control
5. *Water-based Paint*
 - Indoor air quality (IAQ)
 - Less off-gassing

6. *Woven Cryton*
 - Durability
 - Aesthetics
 - Infection control
 - Moisture barrier
 - Readily available product
7. *Vinyl Upholstery*
 - Durability
 - Ease of maintenance
 - Infection control
 - Moisture-proof
 - Bleach-resistant

2.3.10 Color & Texture Selection

Nursing Home design should consider colors and hues. The principal hues are composed of three distinct palettes - warm, cool and neutral.

1. *Warm*

Warm colors are generally associated with physical warmth and the resultant sense of contentment. Warm colors can be used where large windows symbolize sunrise and sunset as features in common areas. Hues on the warm side of the color circle (red, orange, and yellow) and their related tints and shades are generally understood as comfortable, cozy, homelike, and pleasant. Interiors with primarily warm color schemes may prove comfortable to occupants with actual air temperatures lower than required to achieve similar comfort in identical spaces using cooler colors.

2. *Neutral*

Neutral colors, depicted by white, black, gray and chromatic colors are desaturated with a high content of neutrals. They fall between warm and cool colors, so they have a less psychological effect on its users – often referred to being “boring” or “bland”.

Neutral colors offer no emotional stimulation or response and should not be used in areas where activity and or group responses are desired.

3. Cool

Cool colors are not associated with calm, relaxing experiences, as the name would indicate. These colors tend to lower the sense of actual air temperature and so are often preferred in situations where excessive heat is anticipated. In terms of interior design, cool colors can often cause depressive and negative behavior.

Colors that suggest comfort and a somewhat home like atmosphere can ease the difficulties and enhance the quality of life in a Nursing Home facility. Color preferences of elderly residents tend to be conservative so that warm paint colors, wood tones and conservative patterns in carpet and drapery are recommended. (See Figures 2.24 and 2.25.)



Figure 2.24

Resident Dining Area
State Veterans Home at Fitzsimons
Aurora, CO

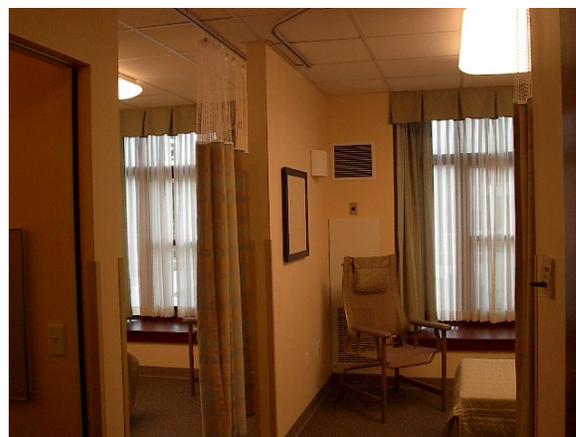


Figure 2.25

Resident Semi-Private Bedroom
State Veterans Home at Fitzsimons
Aurora, CO

2.3.11 Wayfinding & Signage

Orientation to and throughout any facility is important. In the case of a Nursing Home, it tends to be of an elevated importance. Disorientation of a Nursing Home resident can be a traumatic experience. To mitigate this occurrence, clear, attractive signage with large contrasting notations is required. (See Figures 2.26.)

Color coding bedrooms and common areas are also helpful tools for the residents when trying to find their way around. In addition, placing a recognizable photograph of a loved one or the resident himself or herself on the residents' bedroom door, aids in wayfinding.

In terms of signage, designers should understand the effects of hue, saturation, and brightness on "attention getting" as they select color schemes.



Figure 2.26

Wayfinding Signage in Corridors
State Veterans Home at Fitzsimons
Aurora, CO

Lighting can be used to identify settings as well as to provide visual acuity. Definition in rooms, adjoining spaces and corridors can be accomplished by planned placement of various types of lighting fixtures. Chandeliers, pendants, table lamps, floor lamps and sconces can all be used to identify spatial relationships, as well as to define usage within a room or area. (See Figure 2.27) Dining alcoves may use pendant fixtures for table placements. Corridors may combine sconces and pendants to accentuate an intersection or feature. Table and floor lamps can serve as symbols of "home-like" settings.



Figure 2.27

Ceiling Pendant
Baltimore Rehabilitation and Extended Care
Center
Baltimore, MD

2.4 Systems Criteria

2.4.1 Heating, Ventilating and Air Conditioning (HVAC)

1. General

The HVAC system should comply with the most current version of Department of Veterans Affairs (VA) HVAC Design Manuals, VA Design and Construction Procedures, VA Master Construction Specifications and VA Standard Details, where applicable. Deviations from the VA guidelines may be made provided approval is obtained from the VA. Where specific VA requirements are not available or indicated in this document, design criteria from industry standards such as ASHRAE, NFPA, and DOE etc. should be submitted to the VA for review and approval.

2. Energy Economic Analysis

The HVAC system should be selected based on an economic analysis performed in compliance with Public Law 95-619 to determine the most cost effective system for the building over a 20-year life cycle.

3. Energy Conservation

Energy conservation should be emphasized in all aspects of the building design. The building should meet the requirements of the most current version of ASHRAE Standard 90.1 and the DOE regulations. These energy standards apply to HVAC systems as well as the building envelope, service water heating, lighting and energy management. Certification should be provided to the VA that the building is designed in compliance with the applicable energy conservation provisions.

4. Exterior Design Conditions

Exterior design conditions should be based on the most current edition of the ASHRAE Fundamentals Handbook. Summer design conditions should be based on the 0.4 percent dry bulb and wet bulb temperatures indicated under "Cooling db/mwb". Where cooling towers are applicable, select the cooling tower based on the wet bulb temperature indicated under "Evaporation wb/mdb". Winter design conditions should be based on the 99.6 percent dry bulb temperature indicated under "Heating dry bulb". The A/E may recommend more severe outdoor climatic conditions for review and approval by the VA.

5. Indoor Design Conditions

Indoor design conditions for each space should be maintained throughout the year. Interior design conditions for all spaces should be maintained in accordance with the most current version of ASHRAE Standard 55. In addition, the conditions shown in Table 2.4 should be maintained.

6. Supply Air Requirements

The supply air volume should be established to meet the cooling load requirements of the occupied space. The supply volume should, however, be modified to meet a) minimum air change requirements, or b) maintain proper space pressurization relative to room exhaust requirements. For all air systems, the supply air minimum airflows shall be established to maintain the minimum air change rates. See Table 2.5. In addition, filtration shall be comprised of a minimum 30% efficient pre-filter and 85% efficient after-filters, where filter efficiencies shall be based

on the most current version of ASHRAE Standard 52.

7. Outdoor Air Requirements

The HVAC design should provide each space with not less than the minimum recommended quantity of ventilation air as indicated in the most current version of ASHRAE Standard 62. In addition to the ASHRAE Standard 62 requirements, the minimum air changes of outside air shown in Table 2.6 should be required.

8. Exhaust Air Requirements

The HVAC design should provide exhaust air to spaces to control the transfer of odors and provide proper room pressurization. At a minimum, exhaust air and pressurization should be provided as shown in Table 2.7

9. Noise Criteria

The HVAC design should provide resulting sound levels in occupied spaces not to exceed the levels shown on Table 2.8 in all octave bands.

10. Seismic Requirements

Where applicable, earthquake resistive design should comply with the most current version of VA Handbook H-18-8, Seismic Design Requirements and the Uniform Building Code. Seismic design also should conform to the most current versions of SMACNA and NUSIG guidelines.

11. Design Features

Economizer: Air conditioning systems should be designed to operate below 48 degrees F (9 degrees C) outdoor air temperature without refrigeration.
Perimeter heat: Provide perimeter heat for bedrooms and other perimeter spaces when the outdoor winter design

temperature is 9 degrees F (-12 degrees C) or lower than interior temperature.

Emergency Power: Emergency power should be provided for, but not limited to, the following equipment/systems:

- All heating water system components (pumps, condensate return pumps, boilers, etc.) where outdoor design conditions are below 20 degrees F (-6 degrees C)
- Automatic temperature control system and components
- Exhaust system serving the isolation suite

12. Temperature Control Criteria

General: The automatic temperature controls should be direct digital control (DDC) with electric or pneumatic actuation of valves, dampers, terminal units, etc. A dedicated standalone building management system (BMS) or engineering control center (ECC) should be provided. The ECC should be capable of being connected to an existing or future ECC at the medical center, if applicable. Final selection of the control system options (pneumatic vs. electric, standalone or tied into existing ECC, etc.) should be reviewed and approved by the VA prior to proceeding with the design of the temperature control system.

Room Temperature Control: Individual room controls should be provided for, but not limited to, the following spaces: one / two bedrooms, anterooms, conference rooms, director's office and corridors. In addition, not more than four interior rooms of similar function should be grouped to one control zone, nor should interior and exterior spaces be grouped on a common zone.

2.4.2 Plumbing

1. General

The plumbing and medical gas systems should comply with the current version of Department of Veterans Affairs (VA) Plumbing Design Manuals, VA Design and Construction Procedures, VA Master Construction Specifications and VA Standard Details, where applicable. Deviations from the VA guidelines may be made provided approval is obtained from the VA. In addition, the design should meet the requirements of the current version of the National Standard Plumbing Code (NSPC) and the National Fire Protection Association (NFPA). Where state or local codes are more stringent than the above requirements, submit criteria to the VA for review and approval.

2. Domestic Water Systems

Water service should be extended to the building to serve the domestic and fire protection systems. Domestic water should be distributed to the plumbing fixtures and equipment. The system should maintain a maximum velocity and pressure in accordance with the National Standard Plumbing Code and provide water hammer arrestors in accordance with ASSE 1010 for sealed wall installations without access panels. Size and locate arrestors per the Plumbing Drainage Institute (PDI). Provide wall hydrants on each exterior wall, not to exceed 200 feet (60 m) apart.

A domestic booster pump system should be provided where street pressure is inadequate. Domestic booster system should include three pumps. One pump should be sized for one-third the total demand and the two

remaining pumps should be sized for two-thirds of the total demand. Provide alternating control for the pumps as well as a pressurized storage tank. Emergency power should be provided for the domestic booster system.

Provide duplex shell and steam coil central water heaters with the capacity of generating the flow demand at 140 degrees F (60 degrees C) with each heater sized to supply 75% of the demand. The heater discharge temperature, however, should be set for 130 degrees F (54 degrees C). A hot water re-circulating system should be provided. The domestic heating water system also should be in accordance with the requirements of the most current version of ASHRAE Standard 90.1.

3. Plumbing Fixtures

Plumbing fixture types and flow restrictors should be in accordance with the current version of the National Standard Plumbing Code. In addition, plumbing fixtures, where required, should comply with the current version of the American with Disabilities Act (ADA) and as per state and Federal requirements.

4. Sanitary and Storm Drainage Systems

Provide an adequate number of sanitary and storm drainage connections from the building. Provide a minimum of two connections from each building with a maximum sanitary sewer size of 12-inch (300 mm). One sanitary connection may be provided if the connection size is six-inch (150 mm) or less. Maximum allowable storm drain size is 15-inch (375 mm). Sizing should be based on

the most current version of the National Standard Plumbing Code.

Kitchen waste, where applicable, should be provided with a grease removal system.

5. *Medical Gas and Vacuum Systems*

Medical compressed air, oxygen and medical vacuum systems should be provided in accordance with the most current versions of NFPA 50 and 99 and the Compressed Gas Association Standards. Air, oxygen and vacuum requirements may range from 10 to 100% of the beds. Coordinate project specific requirements with the VA.

6. *Seismic Requirements*

Where applicable, earthquake resistive design should comply with the most current version of VA Handbook H-18-8, Seismic Design Requirements and the IBC. Seismic design also should conform to the most current versions of SMACNA and NUSIG guidelines.

2.4.3 Electrical

1. *Electrical Closets*

Provide separate electrical closets with clearances in accordance with the requirements of the National Electrical Code (NEC). In buildings having multiple floors, stack closets.

2. *Public Utility Requirements*

Contact servicing agencies and comply with their requirements for electric services. Make necessary submittals to utility companies for approval of equipment to be installed.

3. *Seismic Restraints*

Requirements should be as specified by local codes and ordinances. Work shall

comply with detailed provisions made by local authorities having plan check and inspection jurisdiction.

4. *Electrical System Characteristics*

Contact the local electric utility company for the type and availability of service. When possible, multiple utility feeders from separate utility substations should be provided for service redundancy. Three phase, 480/277 volt or 208/120 volt secondary systems are acceptable. A utility owned, pad mounted transformer is preferred for these services. Service entrance equipment should comply with the VA Electrical Design Manual.

5. *Emergency Power*

An emergency generator should be provided as an electrical source for power and lighting during an interruption of the normal electric supply. Where stored fuel is required, storage capacity should permit continuous operation for at least 24 hours. The specific loads and branch circuit arrangement should comply with NEC Article 517 as well as the VA Electrical Design Manual Chapter 4.

6. *Lighting*

Comply with the Illuminating Engineering Society (IES) recommended lighting levels. Resident rooms should utilize natural light as much as possible. In addition, general lighting and night lighting are required. A reading light should be provided for each resident. Reading light controls should be readily accessible to residents. At least one night light fixture in each resident room should be controlled at the room entrance. All light controls in resident areas should be

silent. Lighting should comply with the VA Electrical Design Manual Chapter 6.

7. Receptacles

Provide each resident room with duplex-grounded receptacles. Provide one at each side of the head of each bed and one on every other wall. Electrical receptacle cover plates or electrical supplied from the emergency system should be distinctively colored or marked for identification. Ground fault interrupters should comply with NFPA 70. Receptacles should comply with the VA Electrical Design Manual Chapter 3.

8. Conduits

Conduits should be rigid where used in damp or exposed locations, or where specifically required by the NEC. PVC conduits should be used where routed underground. Electrical metallic tubing should be used in dry concealed locations and furred ceiling spaces. Flexible conduits should be used for final connections to recessed lighting fixtures, to motor driven equipment and vibrating equipment. PVC Schedule 40 conduits should be used for concrete encased feeders. PVC Schedule 80 conduits should be used for direct buried branch circuits. Conduit should not be used as a ground path; all electrical circuits should contain a ground wire. Minimum conduit size should be 0.5 inches [13 mm].

9. Conductors

Provide copper conductors with 600-volt insulation for low voltage distribution.

Conductors No. 8 and larger should be stranded, type THWN. Smaller conductors should be a solid type THHN/THWN. Aluminum conductors are not permitted. Conductors for use in high temperature locations should be insulated as required by the NEC. Minimum size of power conductors should be No. 12.

10. Nurse Call System

Provide a nurse call system. Provide each bed location with a call device. An emergency call system should be provided at each resident toilet, bath, and shower room. This system should be accessible to a resident lying on the floor. Design the emergency call system so that a call activated by a resident will initiate a signal distinct from the regular staff call system and that can be turned off only at the resident's location. The signal should activate an annunciator panel at the staff work area or other appropriate location, and either a visual signal in the corridor or at the resident's door.

Wireless technologies for staff should be studied along with hard wired or integrated systems, to meet the needs of individual facilities.

11. Fire Alarm System

Provide fire alarm and detection systems in compliance with NFPA 101 and NFPA 72 as well as VA Fire Protection Design Manual.

2.4.4 Reference Tables

<u>Room or Area</u>	<u>Summer</u>		<u>Winter</u>	
	<u>db (°F)</u>	<u>max RH %</u>	<u>db (°F)</u>	<u>min RH %</u>
One / Two Bed Rooms	76	50	78	30
Ante Rooms	76	50	78	30
Dining Room	78	50	72	30
Lounges	78	50	72	30
Bathrooms & Toilet Rooms	78	--	72	--
Offices / Conference Rooms	78	50	72	30
All other occupied spaces	78	50	72	30

Table 2.4

INDOOR DESIGN CONDITIONS

<u>Room or Area</u>	<u>Minimum Design Supply Air Changes per Hour</u>
One / Two Bed Rooms	4
Ante Room	12
Dining	10
Smoking Room	12
Corridors	4

Table 2.5

SUPPLY AIR REQUIREMENTS

** See CDC criteria as higher air change rates may be required to meet the intent of the CDC requirements dependent upon HVAC distribution methodology.

<u>Room or Area</u>	<u>Minimum Air Changes per Hour of Outside Air</u>
One / Two Bed Rooms	2
Offices	1

Table 2.6

OUTDOOR AIR REQUIREMENTS

<u>Room or Area</u>	<u>Room Pressure</u>	<u>Minimum Exhaust Air Changes per Hour</u>
Bathing Facilities	Negative	10
Bathrooms & Toilet Rooms	Negative	10
Clean Utility	Positive	Supply air minus 15%
Locker Rooms	Negative	Supply air plus 15%
Soiled Linen / Utility	Negative	6
Storage Rooms (soiled or dirty)	Negative	Supply air plus 15%

Table 2.7

EXHAUST AIR REQUIREMENTS

<u>Room or Area</u>	<u>Maximum NC Level</u>
One / Two Bed Rooms	35
Bathrooms & Toilet Rooms	40
Dining	45
Offices, Lobbies, Waiting Areas	35

Table 2.8

NOISE CRITERIA

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2.5 Guide Plates, Reflected Ceiling Plans and Data Sheets

Architectural Notes

Applicable Codes and Standards: See 2.1 Codes and Standards.

1. All new construction and all renovated sleeping areas shall be fully protected by an automatic sprinkler system. Project-specific conditions may apply that require sprinklering of renovation in non-sleeping areas as well.
2. The data sheets, which accompany each guideplate, list equipment in the following format:

	QUANTITY	AI	DESCRIPTION

Table 2.5.1

The legend for the Equipment Tables is as follows:

QUANTITY - Quantity of equipment in Long Term Care Nursing Units.

AI - Acquisition/Installation

vv – VA furnished and VA installed

vc – VA furnished and Contractor installed

cc – Contractor furnished and Contractor installed

cv – Contractor furnished and Contractor installed

Note: The above may vary from project to project

DESCRIPTION – Detailed specification of equipment.

3. When producing architectural drawings for the VA, designers should follow Standard Detail 00000-1.DWG (PG-18-4) which outlines the accepted symbols for designating equipment with regard to accountability as to procurement and installation responsibilities.
4. Provide reinforcement behind automatic door push plates.

Hardware Schedule

All locks and latch sets in the long-term care facility are to have lever handles. Hardware sets correspond to VA Master Construction Specifications, Section 08710, Builder's Hardware, except as noted*. Refer to Section 08721 for Automatic Door Operators.

HW 4

Butts as required
Door Pull
Push Plate
Closer C02011
Armor Plate
Holder C22511

HW 6

Butts as required
Door Pulls
Push Plates
Combination Closer / Holder

HW 7

Butts as required
Latch F01 or F75

HW 13

Butts as required
Lock F07 or F86

HW 14

Butts as required
Lock F02 or F76
Provide Emergency Key
Provide turn piece on
both sides of lock

HW 23

Butts as required
Lock F04 or F81

HW 43

Butts as required
Lock F07 and F86
Closer C02051

HW 45

Butts as required
Lock F04 or F81
Closer C02011

HW 52

Butts as required
Latch F04 or F81

HW 69

Butts as required
Lock F17 or E16071
Door Pull
Push/Pull plate J300
Closer C02051
Armor Plate

HW 126

Butts as required
Lock F17 or E16071
2 Flush Bolts Top / Bot
2 Push Pull Plates J300
2 Door – pulls
2 Armor Plates

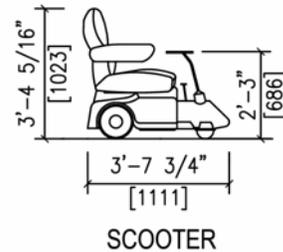
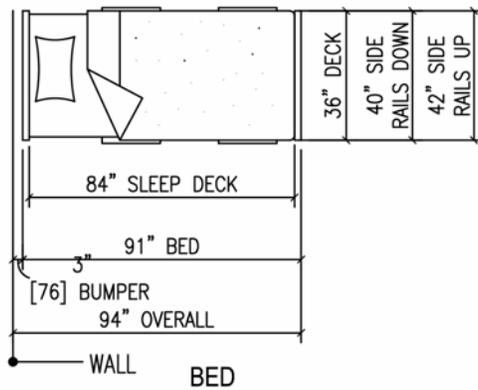
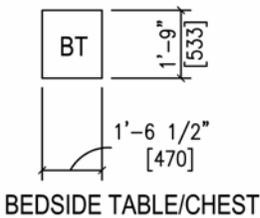
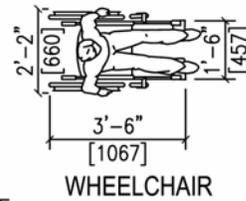
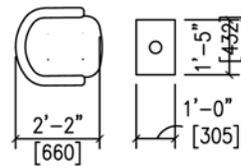
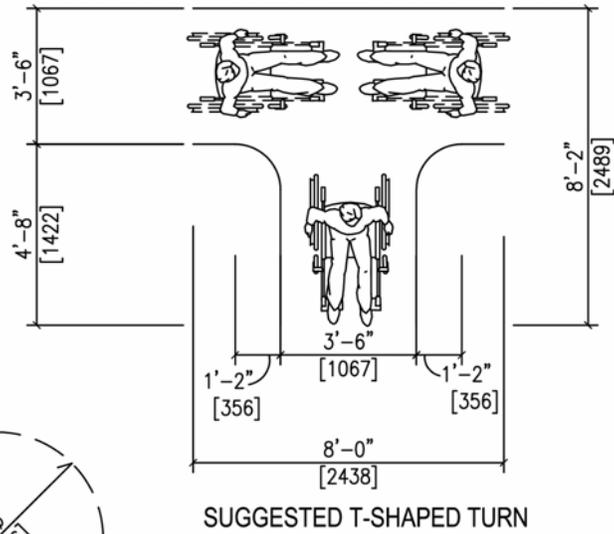
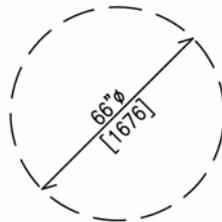
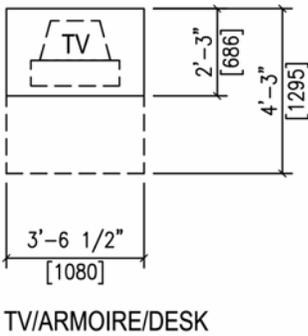
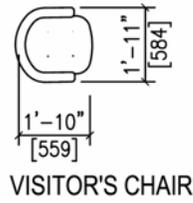
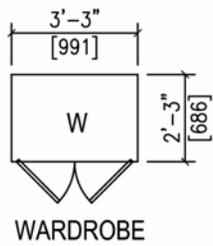
Abbreviations

A	Amps
AC	Air Condition
A.F.F.	Above Finished Floor
AF	After Filter
AI	Acquisition and Installation
AR	As Required
CF	Construction Funds, Department of Veterans Affairs Furnished, Installed by VA or Contractor
CC	Contractor Furnished and Installed, Construction Funds
CT	Corrective Therapy
CPU	Central Processing Unit
CRS	Corrosion-Resisting Steel
DISP	Dispenser
ES	Equipment Symbol
FC	Foot Candle
FPS	Fire Protection System
MCS	Master Construction Specifications
MIN	Minimum
NFPA	National Fire Protection Association
NSF	Net Square Feet
PF	Pre-Filter
PBPU	Patient Bedside Power Unit
RB	Rubber Base
RH	Relative Humidity
PT	Physical Therapy
OT	Occupational Therapy
SD	Standard Detail, see PG-18-4
SS	Stainless Steel
TPD	Toilet Paper Dispenser
TYP	Typical
VC	Department of Veterans Affairs Furnished Contractor Installed, Medical Care Funds for Purchase, Construction Funds for Installation
VV	Department of Veterans Affairs Furnished and Installed, Medical Care Funds
W	Watts
V	Volts

Legend of Symbols

	GROUND FAULT INTERRUPTOR		NURSE CALL STAFF STATION
	JUNCTION BOX		NURSE CALL DOME LIGHT
	HUMIDISTAT		FIRE EXTINGUISHER
	THERMOSTAT		FIRE ALARM/MANUAL PULL STATION
	NIGHT LIGHT		FIRE ALARM/AUDIO-VISUAL DEVICE
	NURSE CALL EMERGENCY STATION		HOSPITAL RADIO TUNER/ VOLUME CONTROL
	NURSE CALL EMERGENCY STATION		VACUUM OUTLET *
	NURSE CALL DUTY STATION		TELEVISION CABLE OUTLET
	SPEAKER		DUPLEX RECEPTICLE
	INCANDESCENT LIGHT FIXTURE		QUADRAPLEX RECEPTICLE
	1 X 4 FLUORESCENT FIXTURE		SINGLE POLE SWITCH
	2' x 4' FLUORESCENT LIGHT FIXTURE		THREE WAY SWITCH
	HVAC SUPPLY		BUILDING SECTION
	HVAC RETURN		FLOOR MOUNTED RECEPTACLE
	TELEPHONE JACK		
	EXIT LIGHT		
	SMOKE DETECTOR		

Resident Room Module Equipment



1. One Bed Room - 175 NSF [16.26 m²]

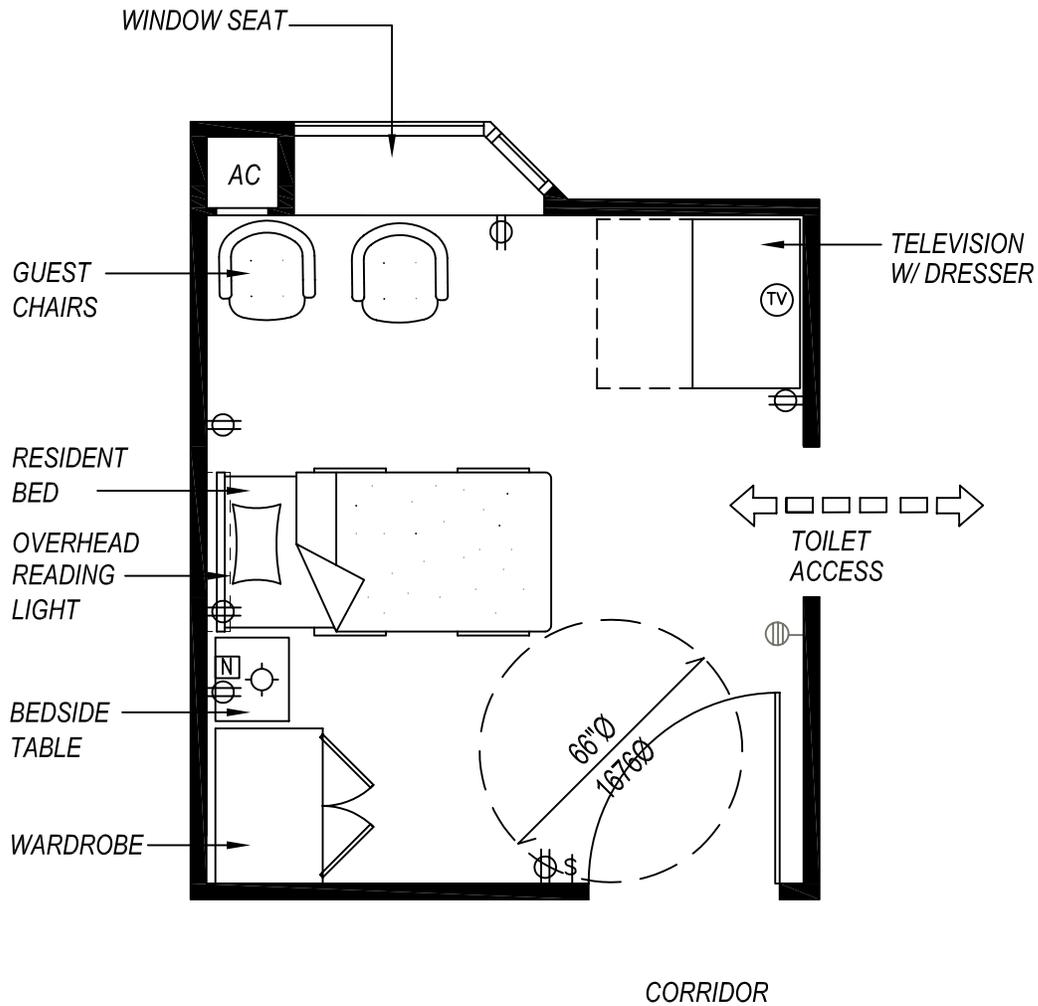
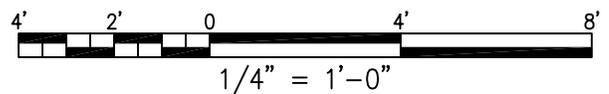


Figure 2.5.1

It may be helpful for the designer to review information in Part 3 - Planning and Design Data for dimensional and planning contextual data.



1. One Bed Room Reflected Ceiling Plan

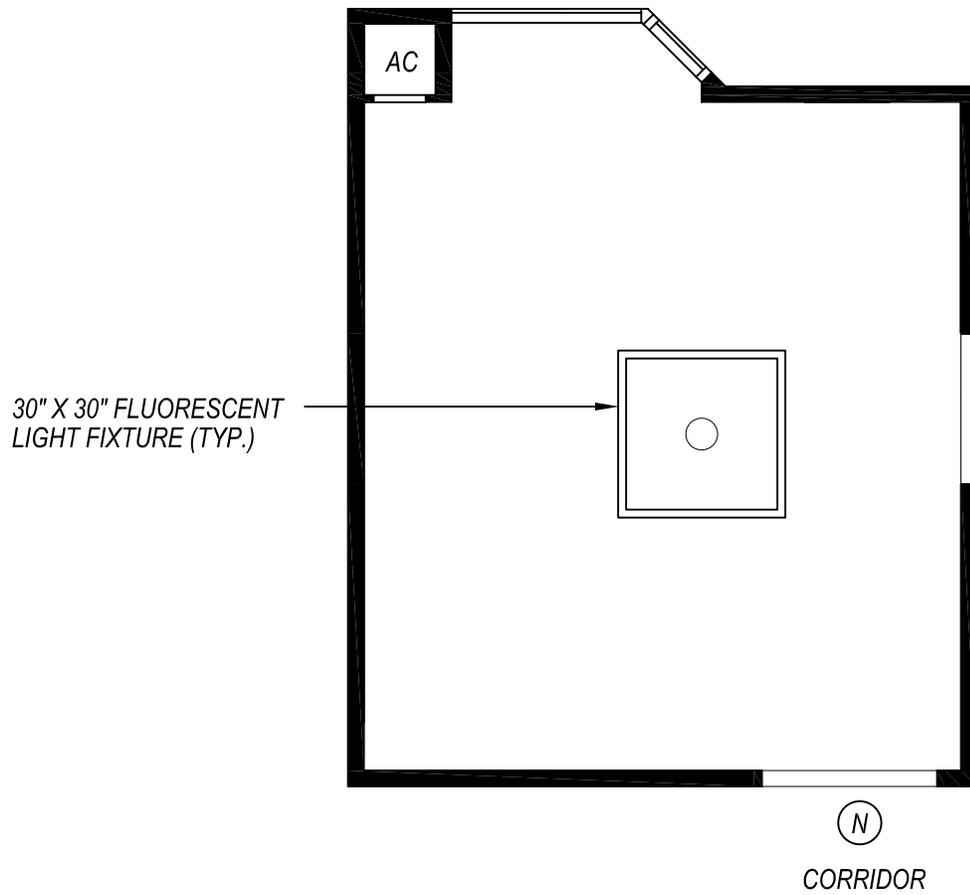
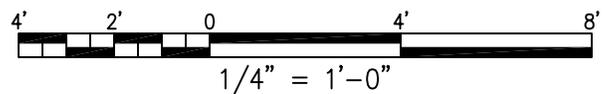


Figure 2.5.2

It may be helpful for the designer to review information in Part 3 - Planning and Design Data for dimensional and planning contextual data.



1. One Bed Room

Function:

The resident room is both an environment for living and a major setting for care. It is typically viewed as one of several "behavior settings" that the resident will occupy each day. It is more than a "bedroom." In Long Term Care, it provides features that support care and routines of daily living.

Space Requirement:

175 NSF [16.26 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile
Base:	RB
Wall Finish:	Gypsum Wallboard*
Ceiling:	Acoustical Tile
Ceiling Height:	9'-0" (8' w/wall-mount TV)
Noise (STC Rating):	
Slab Depression:	None
Special Construction:	-
Hardware:	7
Doors:	4'-0" x 7'-0" wood or metal, optional view glass panel.
Windows:	Required by code, operable, see PG-18-3, Topic 1, Codes and Standards.

*Vinyl Wallcovering at Lavatory

HVAC:

Temperature/Humidity:	
Summer:	76° F, Max. 50% RH
Winter:	78° F, Min. 30% RH
Min. Air Changes/Hour:	4 AC/H
Min. % Outside Air:	2 AC/H
Pressure:	-
Noise Criteria:	Max. 35 NC

Electrical:

Lighting Levels:	
Gen. Illum:	10fc
Task Illum:	30fc
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gases:	N/A
Night Lights:	Y
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

2. Two Bed Room - 390 NSF [36.23 m²]

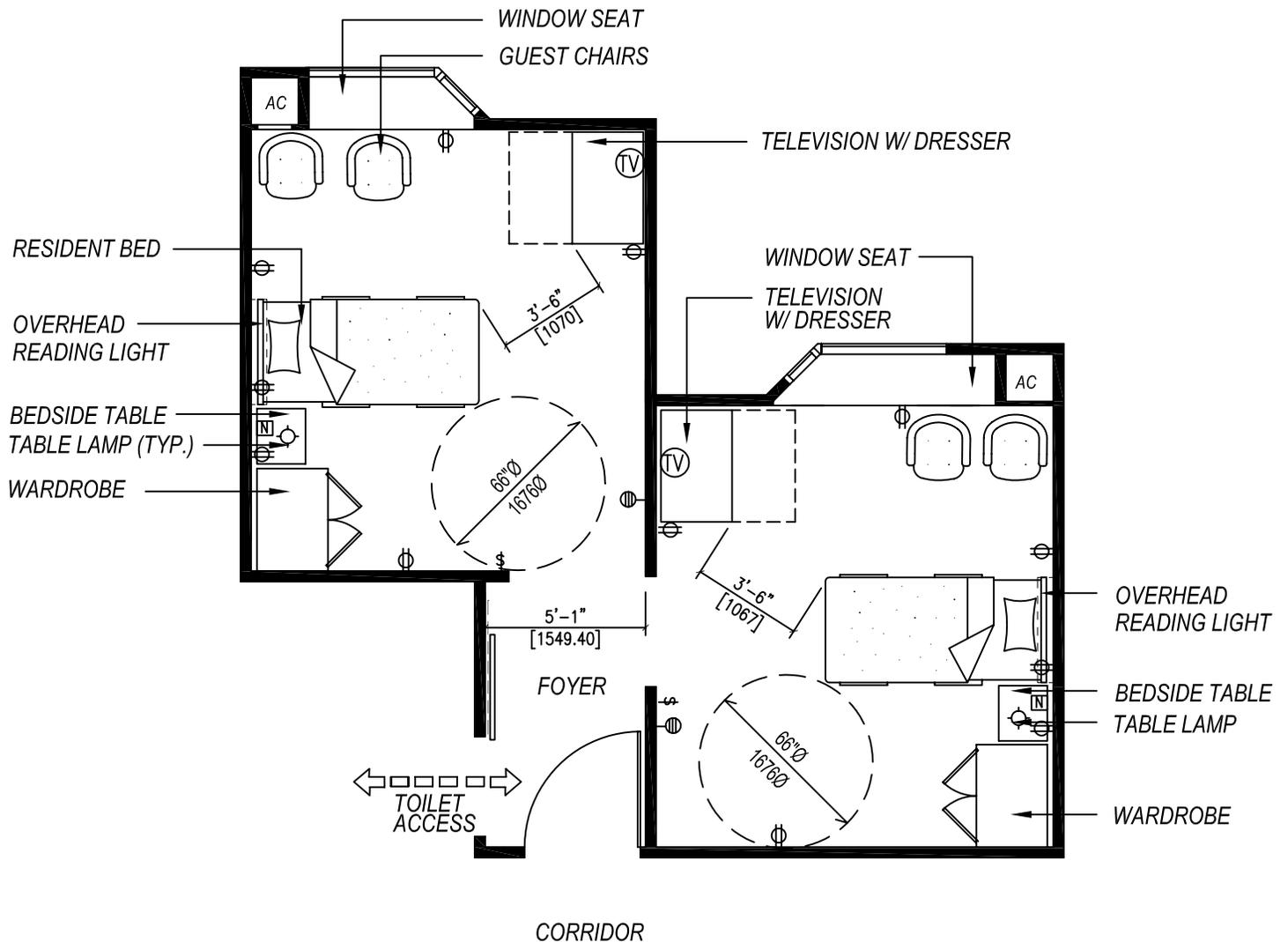
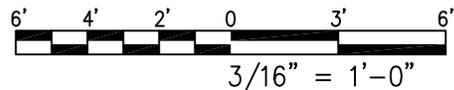


Figure 2.5.3

It may be helpful for the designer to review information in Part 3 - Planning and Design Data for dimensional and planning contextual data.



2. Two Bed Room Reflected Ceiling Plan

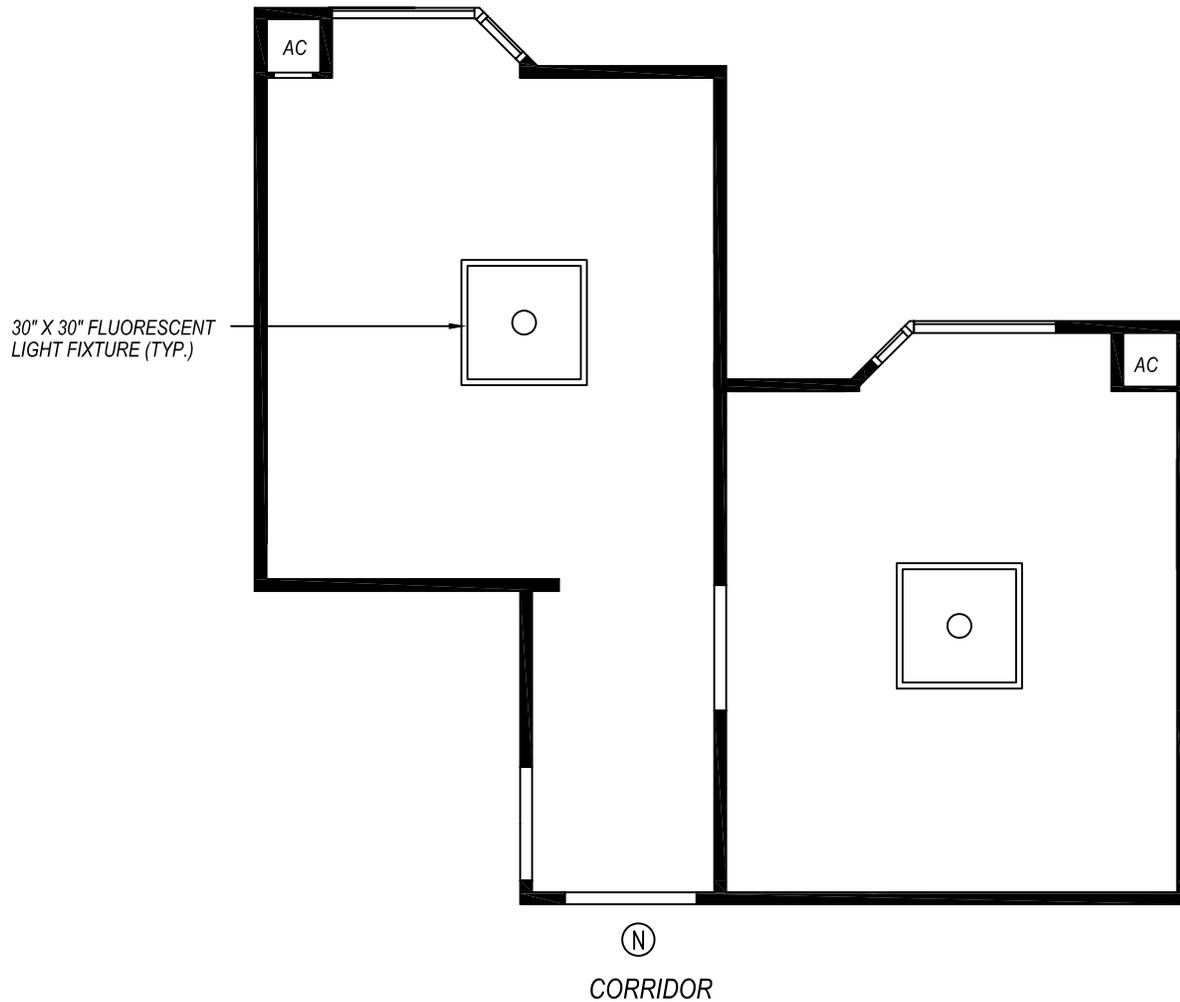
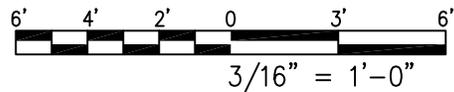


Figure 2.5.4

It may be helpful for the designer to review information in Part 3 - Planning and Design Data for dimensional and planning contextual data.



2. Two Bed Room

Function:

This space is intended to accommodate two residents sharing a toilet room. The resident room is both an environment for living and a major setting for care. It is typically viewed as one of several "behavior settings" that the resident will occupy each day. It is more than a "bedroom." It provides features that support care and routines of daily living. It is used by two residents with similar care needs.

Space Requirement:

390 NSF [36.23 m²]

Architectural:

Finish Code:	1A
Floor Finish:	Vinyl Composition Tile
Base:	Vinyl
Wall Finish:	Gypsum Wallboard*
Ceiling:	Acoustical Tile
Ceiling Height:	9'-0" (8' w/wall-mount TV)
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	7
Doors:	4'-0" x 7'-0" wood or metal, optional view glass panel.
Windows:	Optional sliding door into toilet.

*Vinyl Wallcovering at Lavatory

HVAC:

Temperature/Humidity:	
Summer:	76° F, Max. 50% RH
Winter:	78° F, Min. 30% RH
Min. Air Changes/Hour:	4 AC/H
Min. % Outside Air:	2 AC/H
Pressure:	-
Noise Criteria:	Max. 35 NC

Electrical:

Lighting Levels:	
Gen. Illum:	10fc
Task Illum:	30fc
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gasses:	N/A
Night Lights:	Y
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

3. Special Care Resident Room - 320 NSF [29.72 m²]

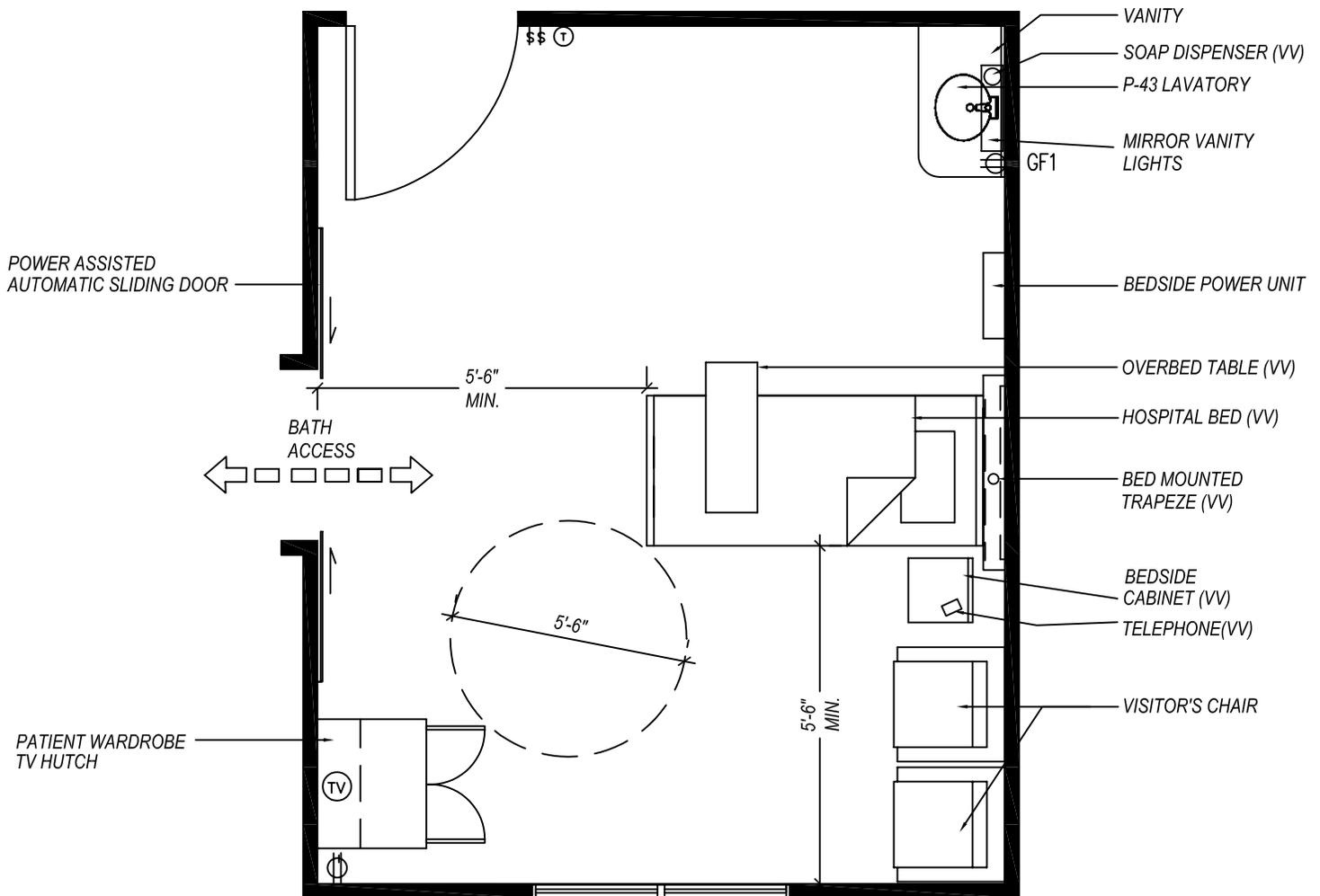
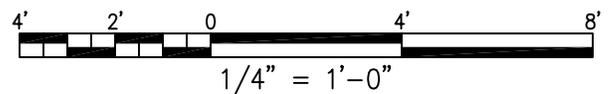


Figure 2.5.5



3. Special Care Resident Room Reflected Ceiling Plan

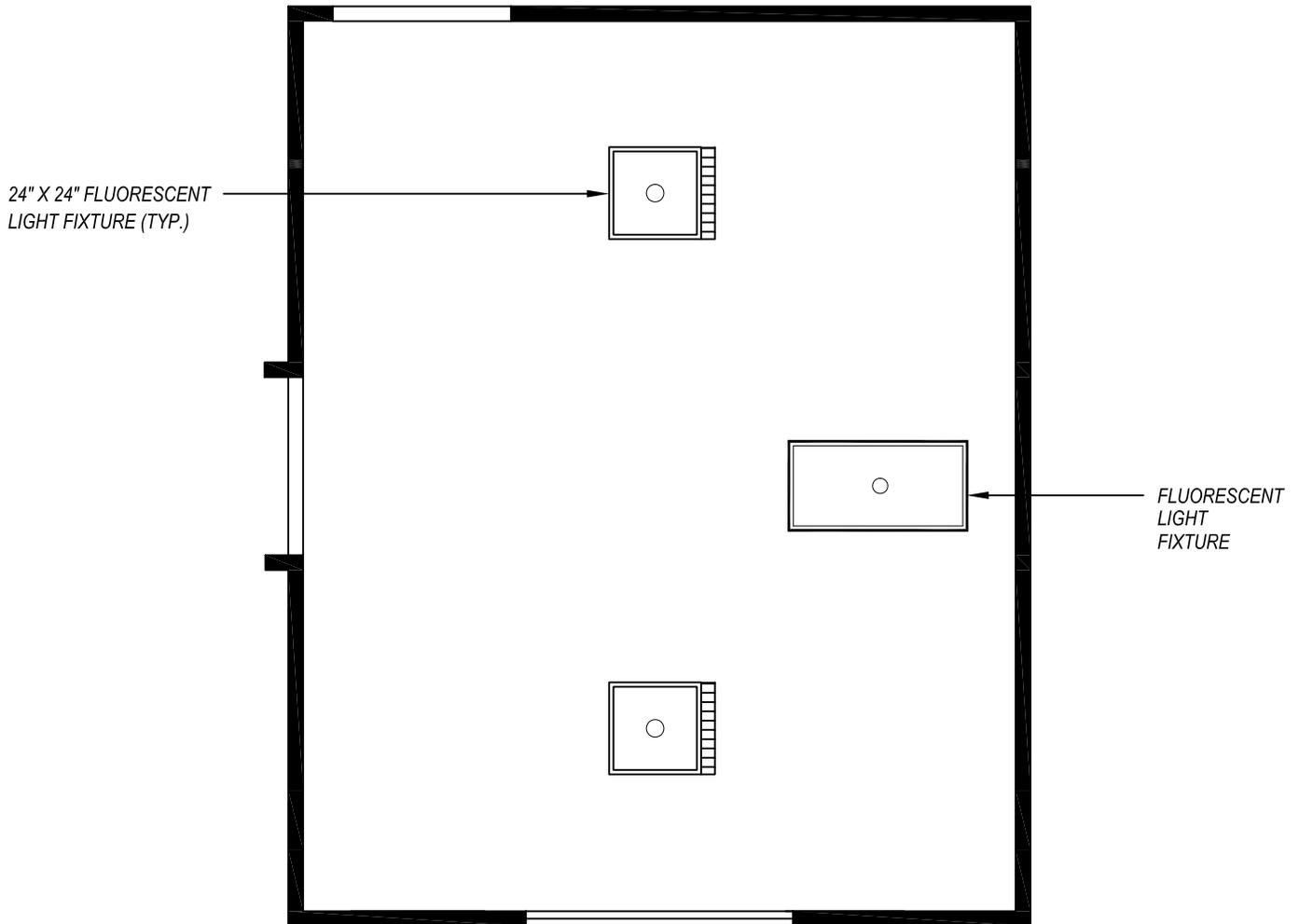
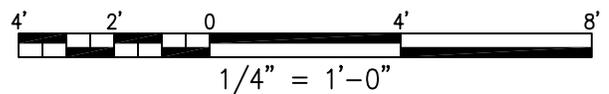


Figure 2.5.6



3. Special Care Resident Room

Function:

In long-term care, this resident room provides features that support care and routines of daily living, and facilitates one's potential to engage in activities beyond personal care. It is used by residents with special care needs such as spinal cord injury.

Space Requirement:

320 NSF [29.72 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile
Base:	Vinyl
Wall Finish:	Gypsum Wallboard*
Ceiling:	Acoustical Tile
Ceiling Height:	9'-0" (8' w/wall-mount TV)
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	7
Doors:	4'-0" x 7'-0" wood or metal, optional view glass panel.
Windows:	

*Vinyl Wallcovering at Lavatory

HVAC:

Temperature/Humidity:

Summer: 76° F, Max. 50% RH

Winter: 78° F, Min. 30% RH

Min. Air Changes/Hour: 4 AC/H

Min. % Outside Air: 2 AC/H

Pressure: N/A

Noise Criteria: Max. 35 NC

Electrical:

Lighting Levels:

Gen. Illum: 10 fc

Task Illum: 60 fc

Over Bed: 30 fc

Emergency

Egress: N/A

Emergency Power:

Medical Gases: N/A

Night Lights: Y

Vanity Lights: N/A

One Receptacle

per PBPU: Y

Nurse Call: Y

3. Special Care Resident Room

Equipment Table:

SYMBOL	QUANTITY	AI	DESCRIPTION
	1		BED WITH MATTRESS, HOSPITAL PATIENT, ELECTRIC, HI-LO, 42"W X 94"L WITH 3" DIA. WHEELS AND TRAPEZE BAR
	1		BUMPER GUARD, 2" DEEP, WALL-MOUNTED OFF THE FLOOR BEHIND HEAD OF BED
	1		TABLE, OVER-BED, ADJUSTABLE HEIGHT, 33"W X 14" D, ON CASTERS
	1		CABINET, BEDSIDE, PORTABLE 20"W X 16"D X 34 ½"H
	1		CHAIR
	1		WARDROBE LOCKER, PATIENT, WITH PUSH BUTTON SECURITY LOCK, 36"W X 25 ½"D X 78"H (TOP SHELF FOR PILLOW AND BLANKET STORAGE) WALL MOUNTED
	1		PREFABRICATED BEDSIDE POWER UNIT: TYPE 3, PG-18-4, SD 16630-12.DWG and 16685-4.DWG
	1		OUTLET, MASTER TELEVISION ANTENNA (H-08-1, MCS 16781: H-08-3, CS 864-1)
	1		BRACKET FOR TELEVISION RECEIVER, CEILING-MOUNTED AT FOOT OF PATIENT BED (PG-18-1, MCS 16781)
	1		RECEIVER, TELEVISION FULL SIZE
	1		RECEPTACLE, ELECTRICAL, CEILING MOUNTED 120 VOLT, 20 AMP FOR CEILING MOUNTED TELEVISION SET (PG-18-1, MCS 16140)
	1		LIGHT, BED (ON WALL OVER BED 7 FEET ABOVE FLOOR) PG-18-1, MCS 16510)
	1		LIGHT, FLUORESCENT, FOR EXAMINATION ILLUMINATION, CEILING MOUNTED OVER EACH BED (PG-18-1, MCS 16510)
	1		LIGHT, NIGHT, INCANDESCENT, CEILING MOUNTED AT ENTRANCE TO BED ROOM WITH SWITCH AT ENTRANCE TO BED ROOM (PG-18-1, MCS 16510)
	1		VANITY, WITH HIGH PRESSURE PLASTIC LAMINATE COUNTER TOP, MOLDED SELF EDGE AND BACKSPLASH (PG-18-1, MCS 12302)
	1		LAVATORY COUNTER MOUNTED, 19" DIAMETER WRIST BLADE HANDLES, GOOSENECK SPOUT (PG-18-1 MCS 15450))
	1		DISPENSER, SOAP, LIQUID, WALL MOUNTED
	1		MIRROR, 24"W X 36"L (PG-18-1, MCS 10800)
	1		LIGHT, FLUORESCENT, VERTICAL BARS WALL MOUNTED AT EACH SIDE OF THE MIRROR (PG-18-1, MCS 16510)

	1		DISPENSER, PAPER TOWEL AND DISPOSAL COMBINATION UNITS (PG-18-1, MCS 10800)
	1		RECEPTACLE, ELECTRICAL, 120 VOLT, 20 AMP WITH GROUND FAULT INTERRUPTER, ADJACENT TO LAVATORY (PG-18-1, MCS 16140)
	1		LIGHT, NIGHT, (PG-18-1, MCS 16510)
	1		RECEPTACLE, ELECTRICAL, DUPLEX, 120 VOLT, 20 AMP (PG-18-1, MCS 16140)
	1		CALL, NURSES PANEL, WITH CORRIDOR SIGNAL LIGHT (PG-18-1, MCS 16761)
			OBSERVATION WINDOW ON CORRIDOR WALL, FIXED FRAME WITH INTEGRAL BLIND CONTROLLED FROM INSIDE THE ISOLATION ROOM.

TABLE 2.5.3
Special Care Resident Room

4. Resident Toilet Room - 58 NSF [2.79 m²]

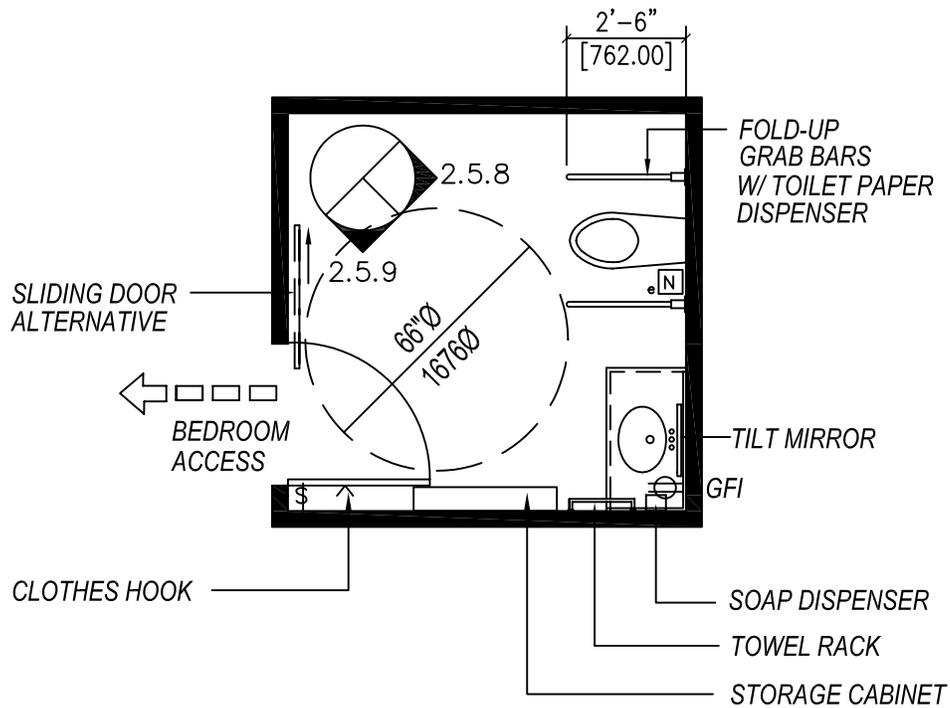


Figure 2.5.7

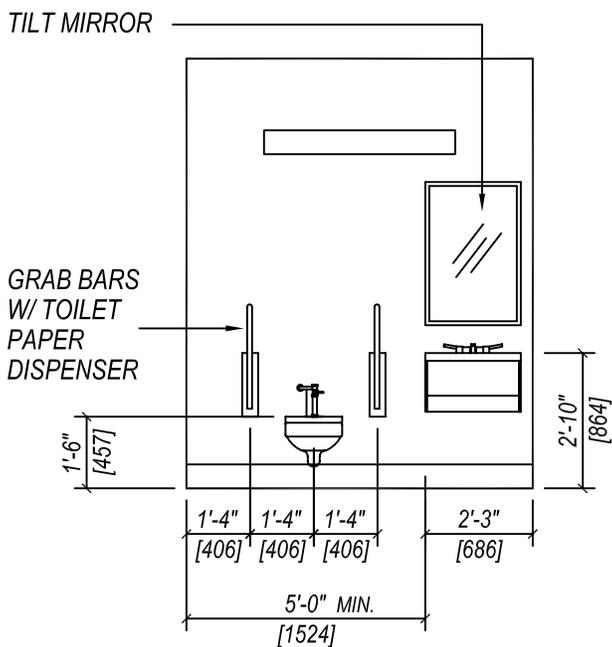


Figure 2.5.8

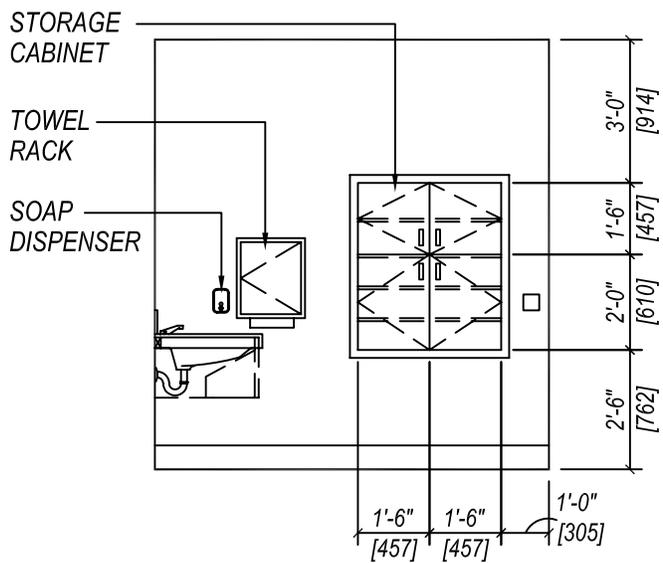
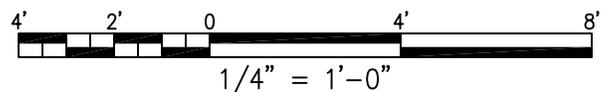


Figure 2.5.9



4. Resident Toilet Room Reflected Ceiling Plan

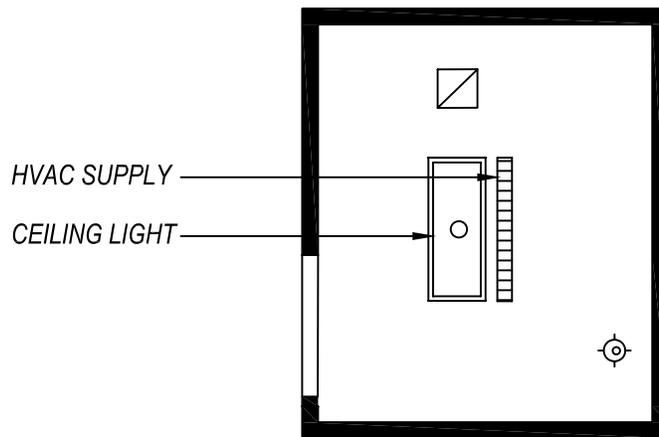
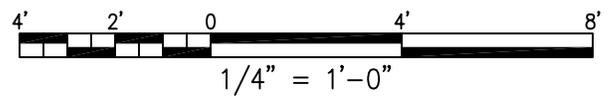


Figure 2.5.10



4. Resident Toilet Room

Function:

The resident toilet room is used by one or two residents with or without staff or caregiver assistance for toileting and personal grooming and is equipped with a toilet and lavatory.

Space Requirement:

58 NSF [2.79 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Ceramic Tile
Base:	Ceramic Tile
Wall Finish:	Gypsum Wallboard
Ceiling:	Gypsum Wallboard
Ceiling Height:	9'-0"
Wainscot	Ceramic Tile 4'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	14
Doors:	3'-0" x 7'-0" wood or metal,
Windows:	

HVAC:

Temperature/Humidity:	
Summer:	78° F
Winter:	72° F
Min. Air Changes/Hour:	10 AC/H
Min. % Outside Air:	N/A
Pressure:	Negative
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	30 fc
Task Illum:	30 fc
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	Y
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

5. Resident Toilet/Shower Room - 90 NSF [8.36 m²]

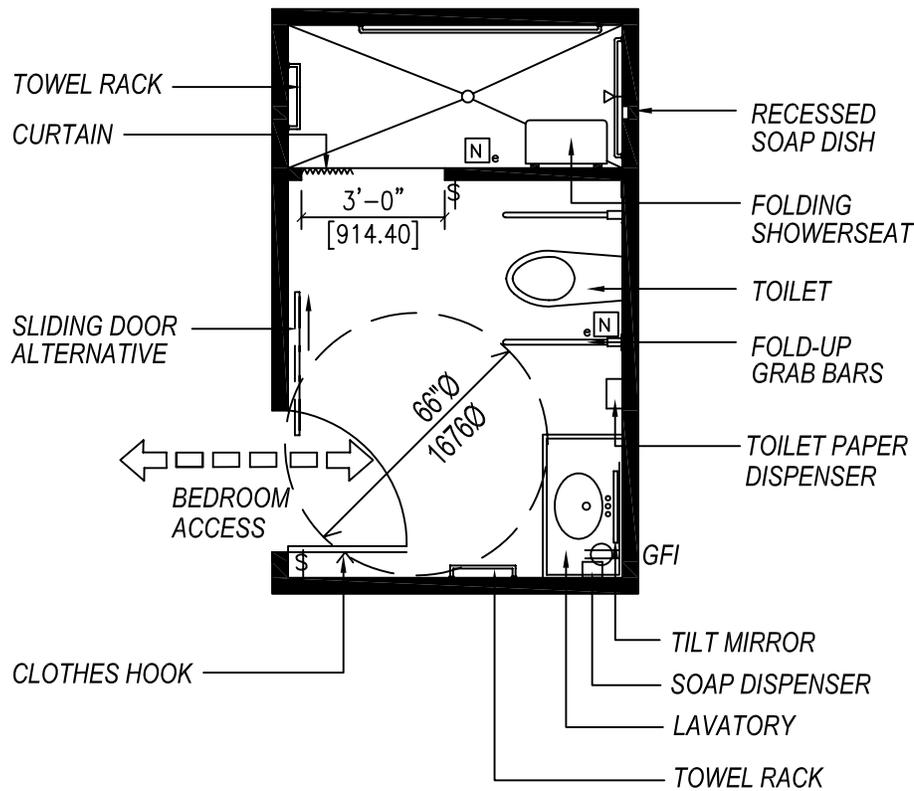
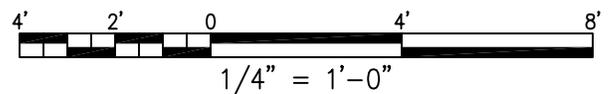


Figure 2.5.11



5. Resident Toilet/Shower Room Reflected Ceiling Plan

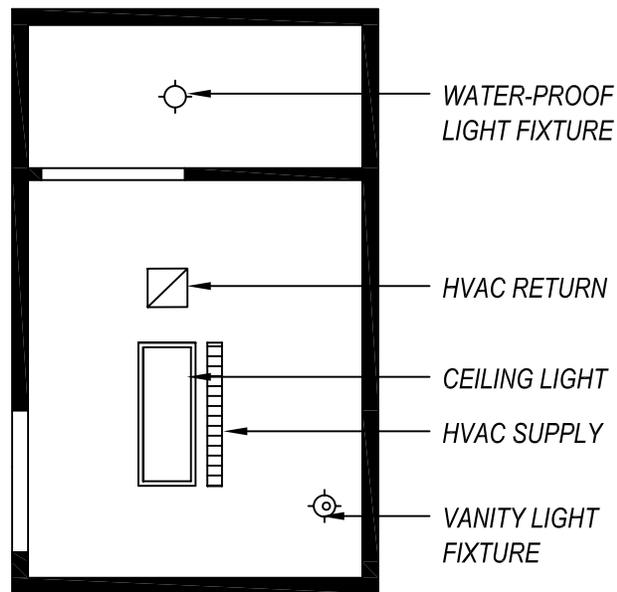
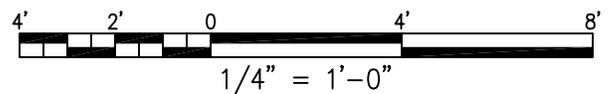


Figure 2.5.12



5. Resident Toilet/Shower Room

Function:

The resident toilet/shower room is used by one or two patients with or without staff or caregiver assistance for toileting/showering and personal grooming. It is equipped with a shower, toilet and a lavatory.

Space Requirement:

90 NSF [8.36 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Ceramic Tile
Base:	Ceramic Tile
Wall Finish:	Gypsum Wallboard
Ceiling:	Gypsum Wallboard
Ceiling Height:	9'-0"
Wainscot:	Ceramic Tile 4'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	14
Doors:	3'-0" x 7'-0" wood or metal,
Windows:	

*Ceramic tile full height tub/shower on concrete backer board.

HVAC:

Temperature/Humidity:	
Summer:	78° F
Winter:	72° F
Min. Air Changes/Hour:	10 AC/H
Min. % Outside Air:	N/A
Pressure:	Negative
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	30 fc
Task Illum:	30 fc
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	Y
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

6. Bathing Suite (Spa Bather) - 360 NSF [33.45 m²]

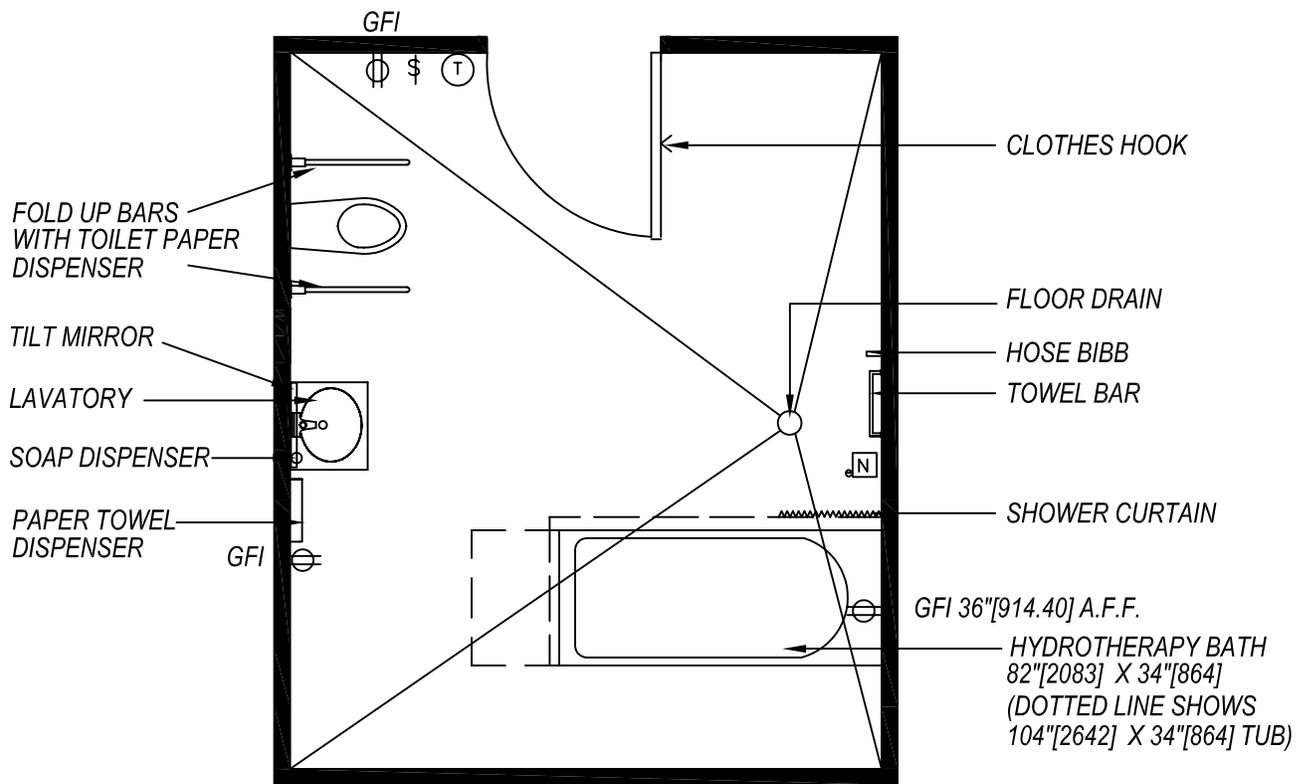
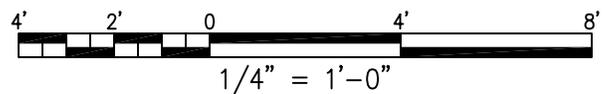


Figure 2.5.13



6. Bathing Suite (Spa Bather) Reflected Ceiling Plan

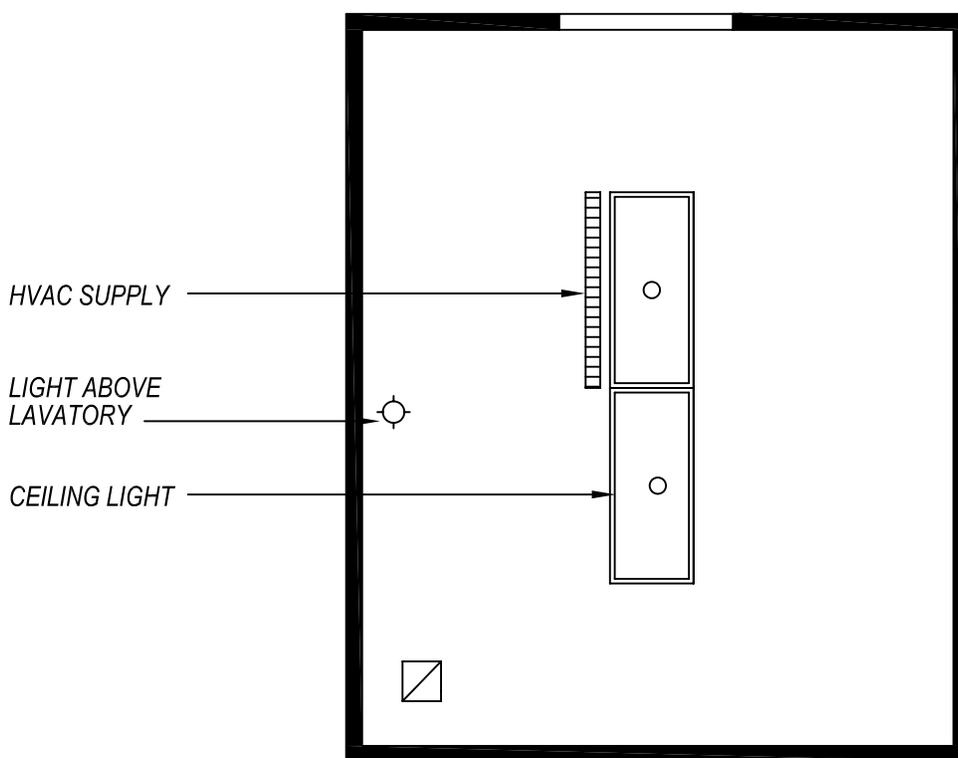
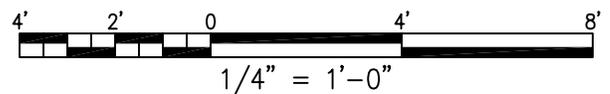


Figure 2.5.14



6. Bathing Suite (Spa Bather)

Function:

The bathing suite, or spa bather, is used typically for one patient at a time with staff assistance for immersion bathing and personal grooming. In addition to the bathing equipment, the bathing suite typically includes a lavatory and toilet.

Space Requirement:

360 NSF [33.45 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Ceramic Tile
Base:	Ceramic Tile
Wall Finish:	Gypsum Wallboard
Ceiling:	Gypsum Wallboard
Ceiling Height:	9'-0"
Wainscot	Ceramic Tile*
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	14
Doors:	3'-8" x 7'-0" wood or metal.
Windows:	

*Ceramic tile full height tub/shower on concrete backer board.

HVAC:

Temperature/Humidity:	
Summer:	78° F
Winter:	72° F
Min. Air Changes/Hour:	10 AC/H
Min. % Outside Air:	N/A
Pressure:	Negative
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	30 fc
Task Illum:	N/A
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	N/A
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

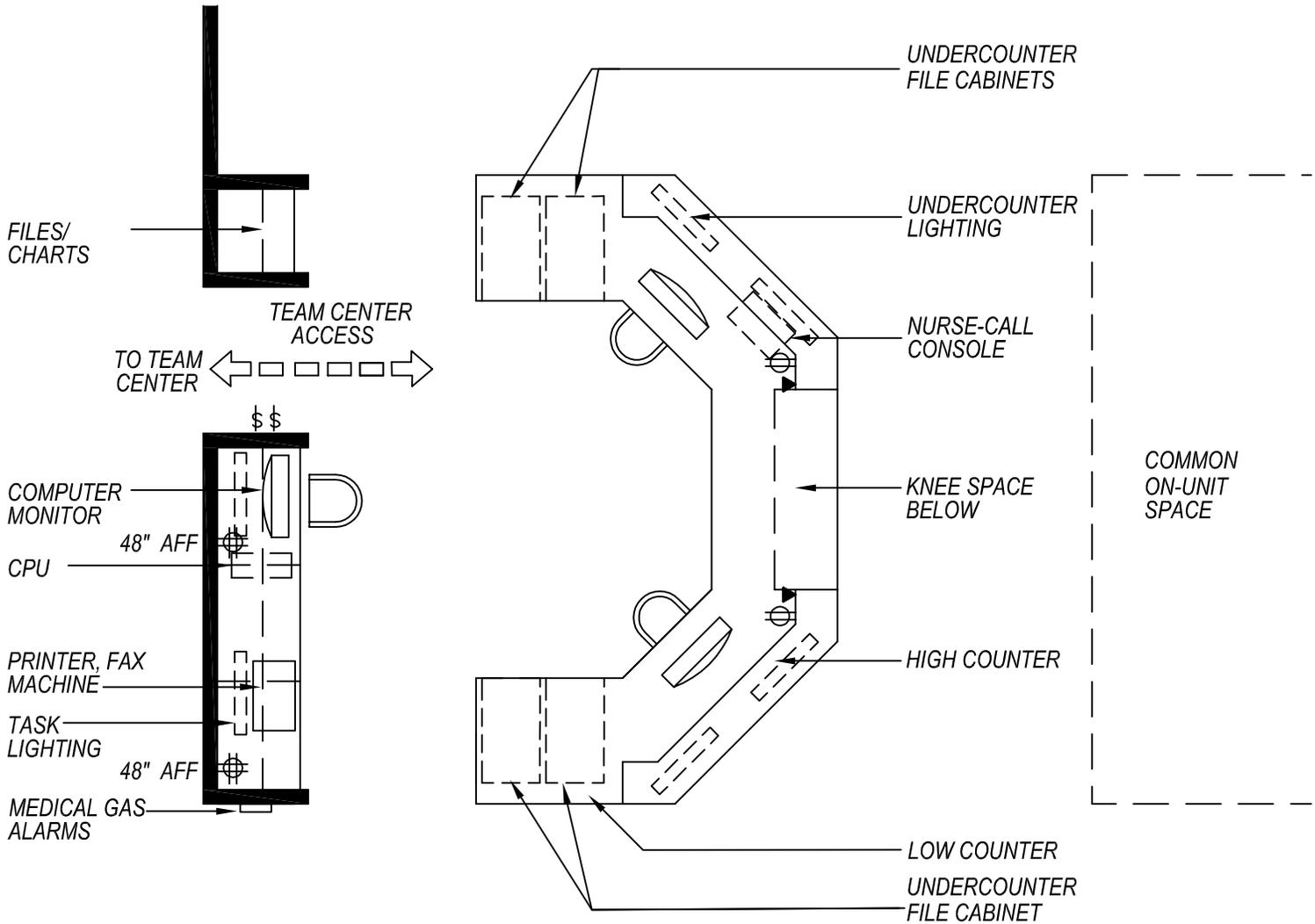
6. Bathing Suite (Spa Bather)

Equipment Table:

SYMBOL	QUANTITY	AI	DESCRIPTION
	1		ROD, CURTAIN, SHOWER
	1		CURTAIN, SHOWER
	1		BATH, HYDROTHERAPY, THERMOSTATIC CONTROL, APPROX. OUTSIDE DIMENSIONS, 914 mm X 1829 mm X 711 mm (36" X 72" X 28")
	1		HOOK, CLOTHES
	1		BAR, TOWEL
	1		HOSE BIBB, COMBINATION FAUCET, WALL MOUNTED, CONCEALED SUPPLY PIPES
	1		FLOOR DRAIN, IN DRYING AREA (PLUMBING DESIGN CRITERIA AND INSTRUCTIONS)
	1		WATER CLOSET, WALL HUNG
	1		BAR, FOLD UP GRAB FOR WATER CLOSET WITH TOILET PAPER DISPENSER
	1		LAVATORY, STRAIGHT BACK
	1		DISPENSER, SOAP, LIQUID, WALL MOUNTED
	1		MIRROR, WHEELCHAIR, 610 mm X 914 mm (24" X 36")
	1		LIGHT, OVER MIRROR
	AR		RECEPTACLE, ELECTRICAL, DUPLEX, 120 VOLT, 20 AMP, WITH GROUND FAULT INTERRUPTER, ADJACENT TO LAVATORY

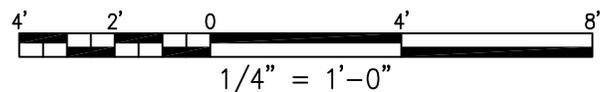
TABLE 2.5.6
Bathing Suite (Spa Bather)

7. Nurses' Station - 205 NSF [19 m²]

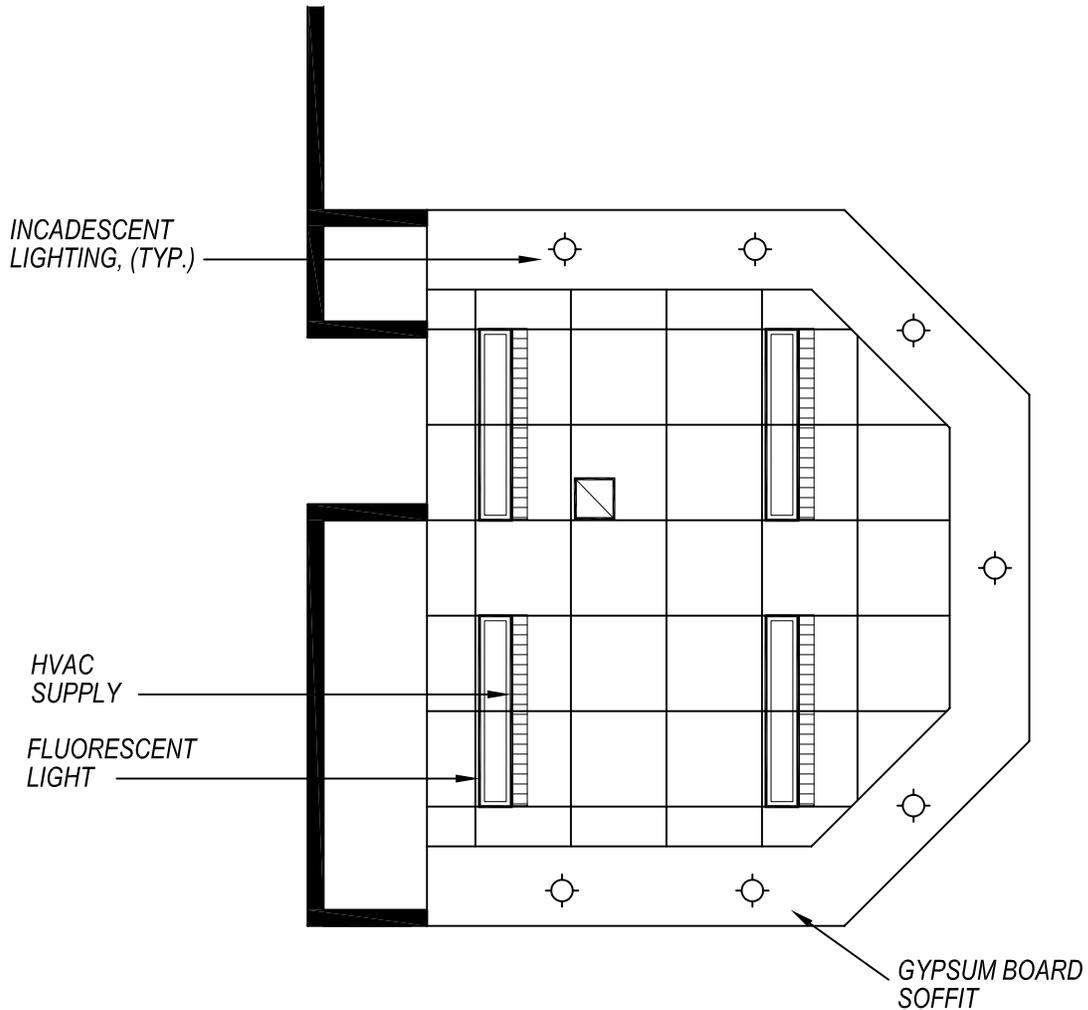


See Part 3.0 Planning and Design Data for preferred On Unit, Dynamic Cluster Desks.
 Room size is variable, use project-specific program for actual size.

Figure 2.5.15

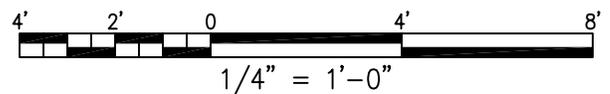


7. Nurses' Station Reflected Ceiling Plan



Room size is variable, see project-specific program for actual size.

Figure 2.5.16



7. Nurses Station

Function:

The nurses station is used by nursing and other clinical staff assigned to patient care; equipped with work stations with computer, printer, and storage.

Space Requirement:

205 NSF [19 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile/ Carpet
Base:	Vinyl
Wall Finish:	Gypsum Wallboard – Vinyl Coated Fabric Wallcovering
Ceiling:	Acoustical Tile
Ceiling Height:	9'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	23
Doors:	
Windows:	

HVAC:

Temperature/Humidity:	
Summer:	78° F, Max. 50% RH
Winter:	72° F, Max. 30% RH
Min. Air Changes/Hour:	-
Min. % Outside Air:	As per ASHRAE Std 62
Pressure:	N/A
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	70 fc
Task Illum:	30 fc
Over Bed:	30 fc night
Emergency	
Egress:	1 fc Ave.
Emergency Power:	
Medical Gases:	Y
Night Lights:	Y
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

8. Clean Utility - 120 NSF [11.15 m²]

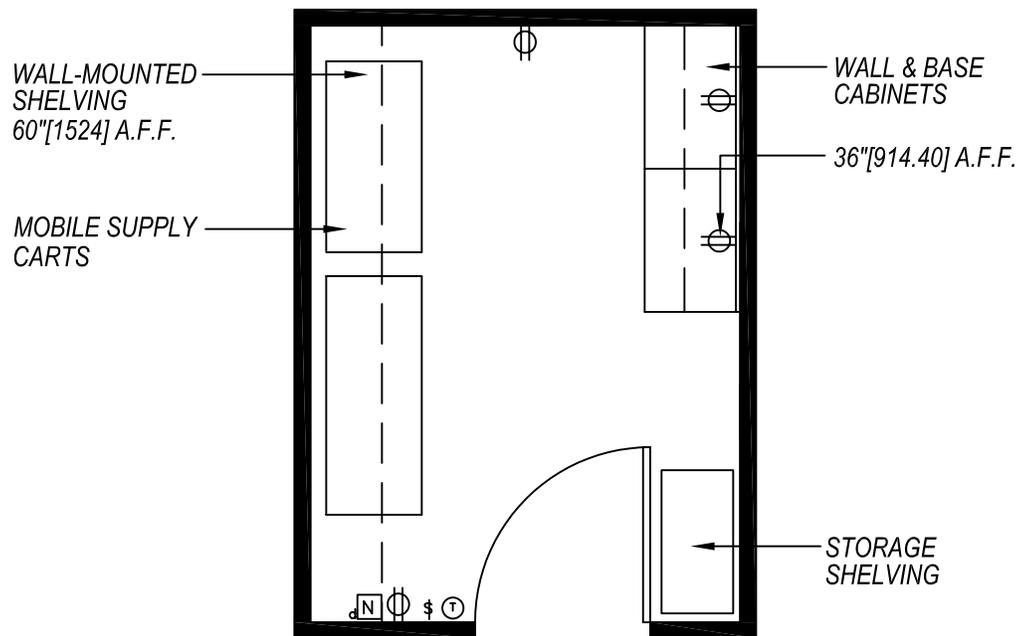
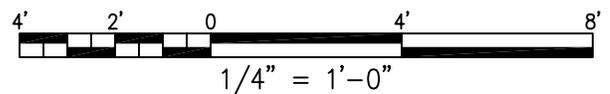


Figure 2.5.17



8. Clean Utility Reflected Ceiling Plan

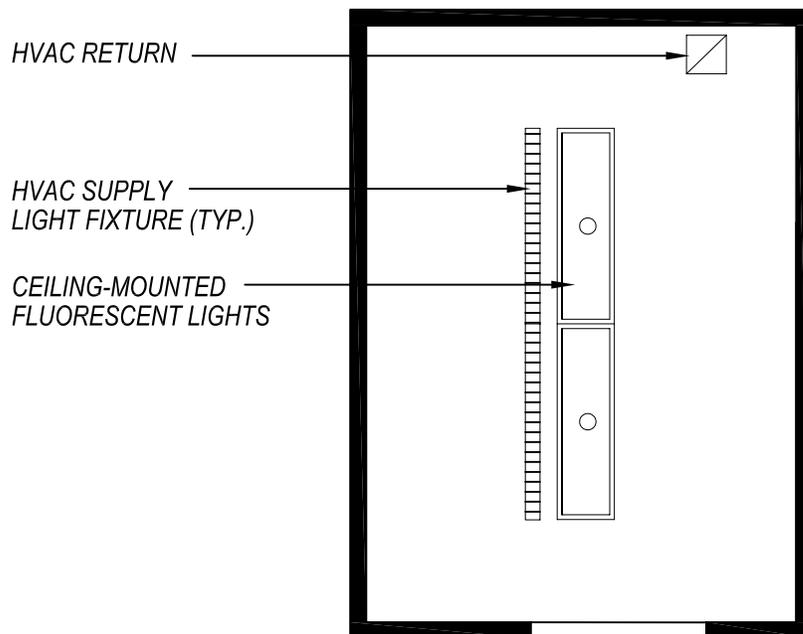
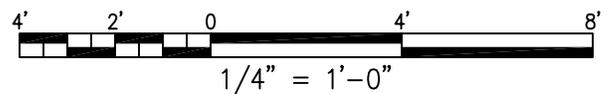


Figure 2.5.18



8. Clean Utility Room

Function:

The clean utility is used by unit staff for storage of medical supply carts and other supplies. It is accessed by Supply/SPD staff to replenish supplies.

Space Requirement:

120 NSF [11.15 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile
Base:	Vinyl
Wall Finish:	Gypsum Wallboard (Structural Clay)
Ceiling:	Gypsum Wallboard
Ceiling Height:	9'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	45
Doors:	4'-0" x 7'-0" wood or metal.
Windows:	

HVAC:

Temperature/Humidity:	
Summer:	78° F, Max. 50% RH
Winter:	72° F, Min. 30% RH
Min. Air Changes/Hour:	4 AC/H
Min. % Outside Air:	2%
Pressure:	Positive
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	20 fc
Task Illum:	N/A
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

9. Soiled Linen/Utility - 100 NSF [9.29 m²]

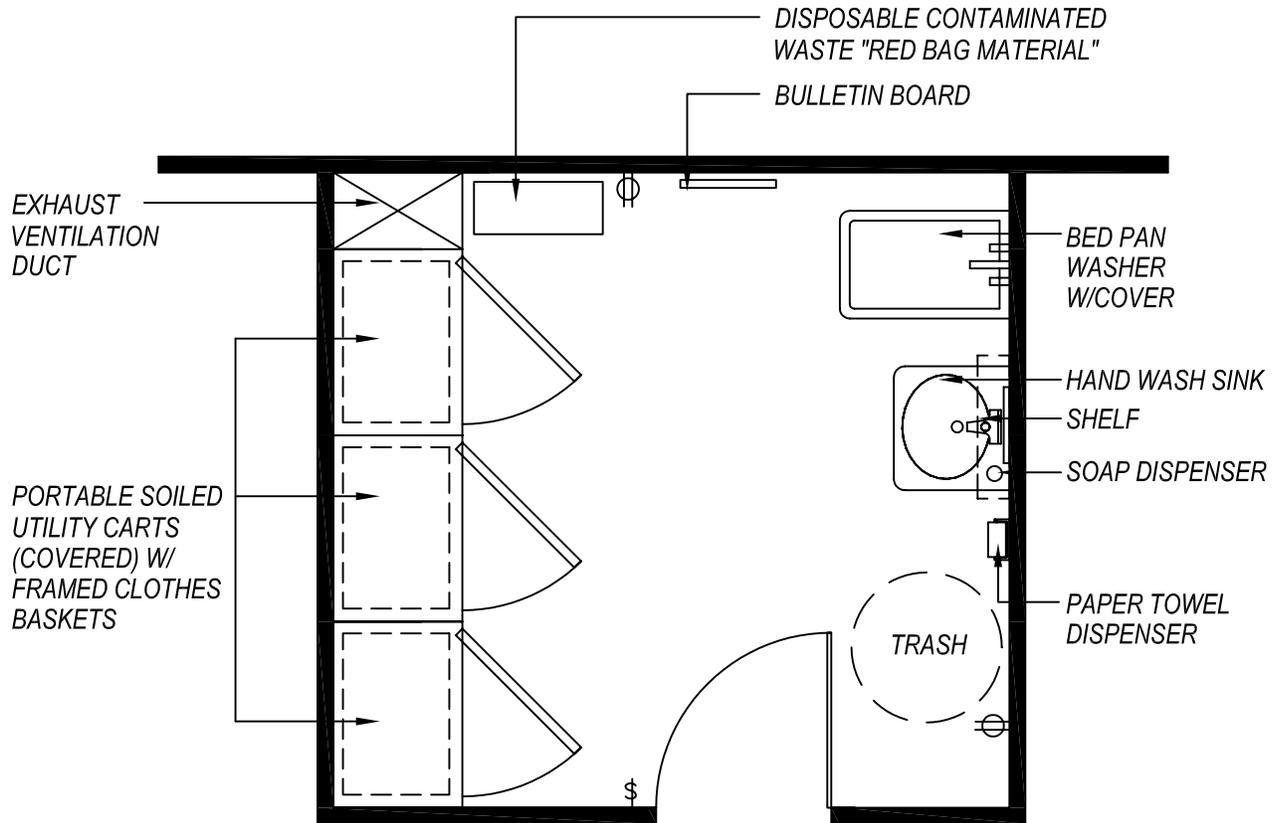
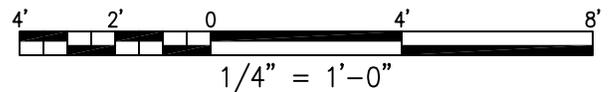


Figure 2.5.19



9. Soiled Linen/Utility Reflected Ceiling Plan

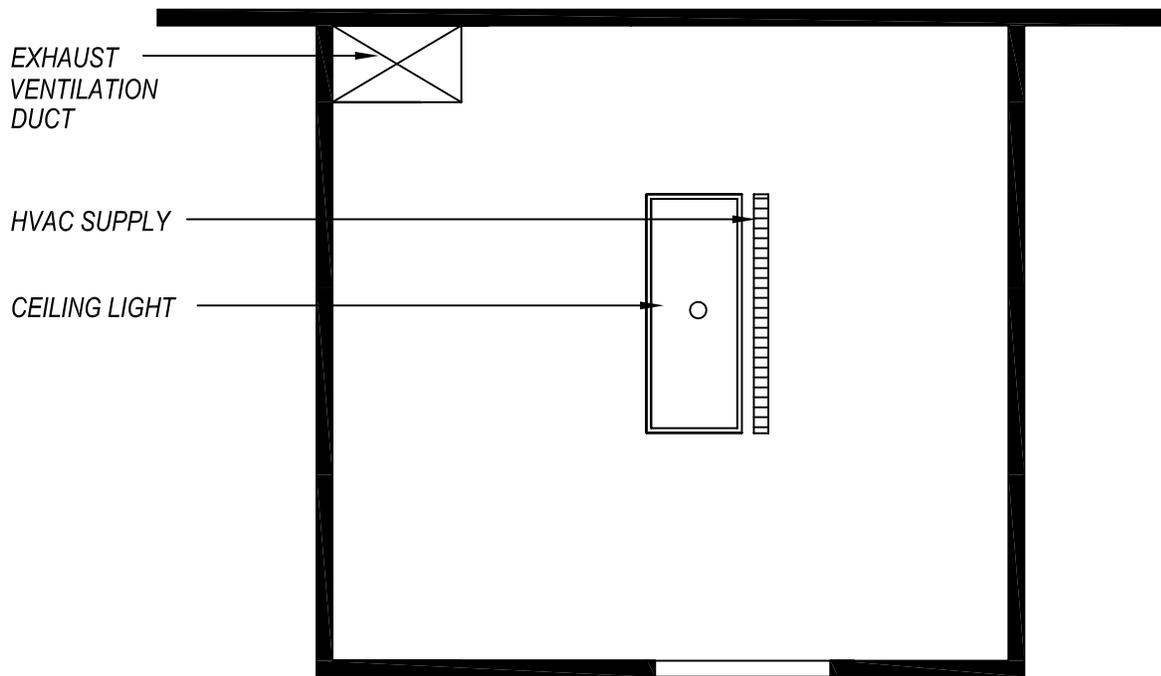
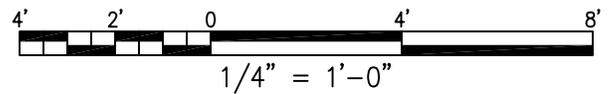


Figure 2.5.20



9. Soiled Linen/Utility

Function:

The soiled utility is used by unit staff for collection of soiled linen and trash in carts. It is accessed by Building Management staff for linen/trash removal.

Space Requirement:

100 NSF [9.29 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Resilient Surface Flooring
Base:	Vinyl
Wall Finish:	Gypsum Wallboard (Structural Clay)
Ceiling:	Gypsum Wallboard
Ceiling Height:	9'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	45
Doors:	3'-8" x 7'-0" wood or metal.
Windows:	

HVAC:

Temperature/Humidity:	
Summer:	78° F, Max. 50% RH
Winter:	72° F, Min. 30% RH
Min. Air Changes/Hour:	10 AC/H
Min. % Outside Air:	2%
Pressure:	Negative
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	10 fc
Task Illum:	N/A
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	N/A
One Receptacle	
per PBPU	N/A
Nurse Call:	N/A

10. Resident Dining Room - 1000 NSF [92.90 m²]

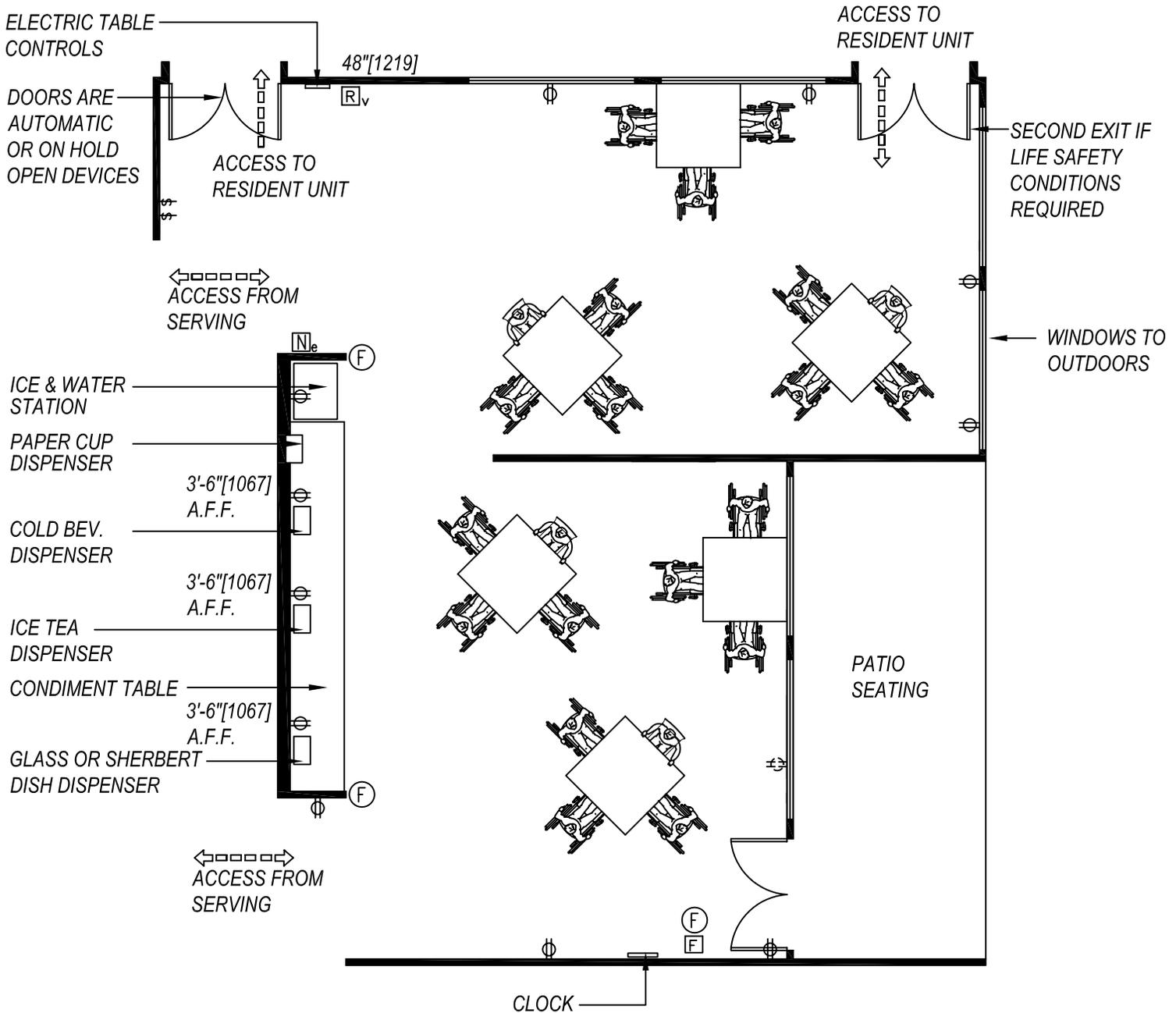
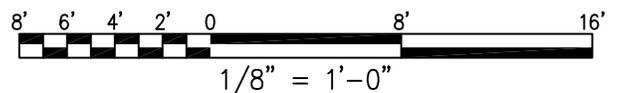


Figure 2.5.21



10. Resident Dining Room Reflected Ceiling Plan

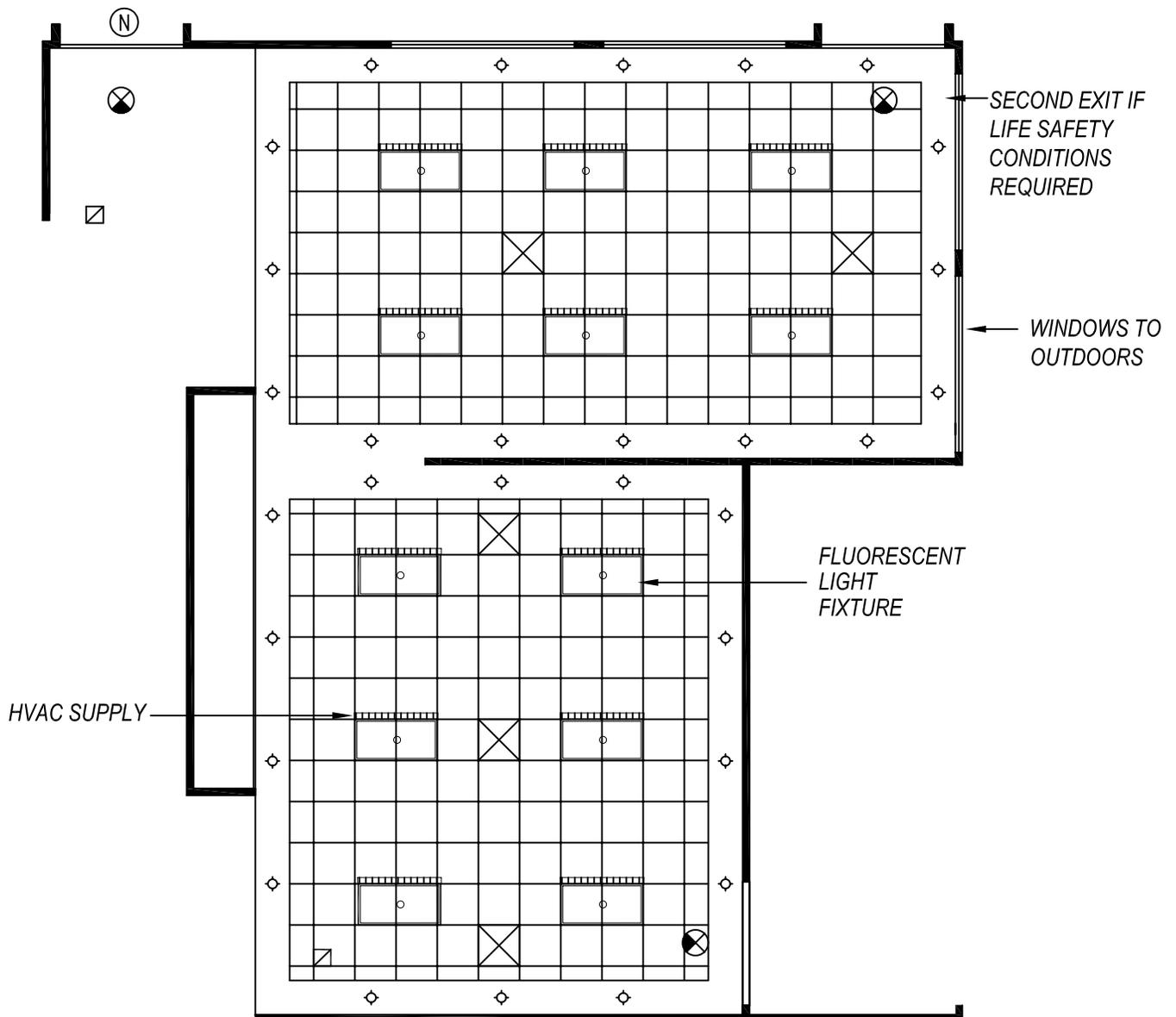
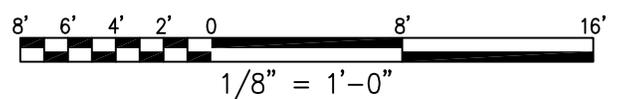


Figure 2.5.22



10. Resident Dining Room

Function:

The resident dining room is used by residents with staff assistance for on-unit dining on a daily basis. The resident dining room may be used for other purposes such as recreation therapy during non-dining hours.

Space Requirement:

1000 NSF [92.90 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile
Base:	Vinyl
Wall Finish:	Gypsum Wallboard – Vinyl Coated Fabric Wallcovering
Ceiling:	Acoustical Tile
Ceiling Height:	10'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	126
Doors:	2 - 3'-0" x 7'-0" wood or metal, optional view glass panel.
Windows:	

HVAC:

Temperature/Humidity:	
Summer:	78° F, Max. 50% RH
Winter:	72° F, Min. 30% RH
Min. Air Changes/Hour:	10 AC/H
Min. % Outside Air:	As per ASHRAE Std 62
Pressure:	-
Noise Criteria:	Max. 45 NC

Electrical:

Lighting Levels:	
Gen. Illum:	30fc
Task Illum:	N/A
Over Bed:	N/A
Emergency	
Egress:	1 fc Ave.
Emergency Power:	
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

11. Corridor

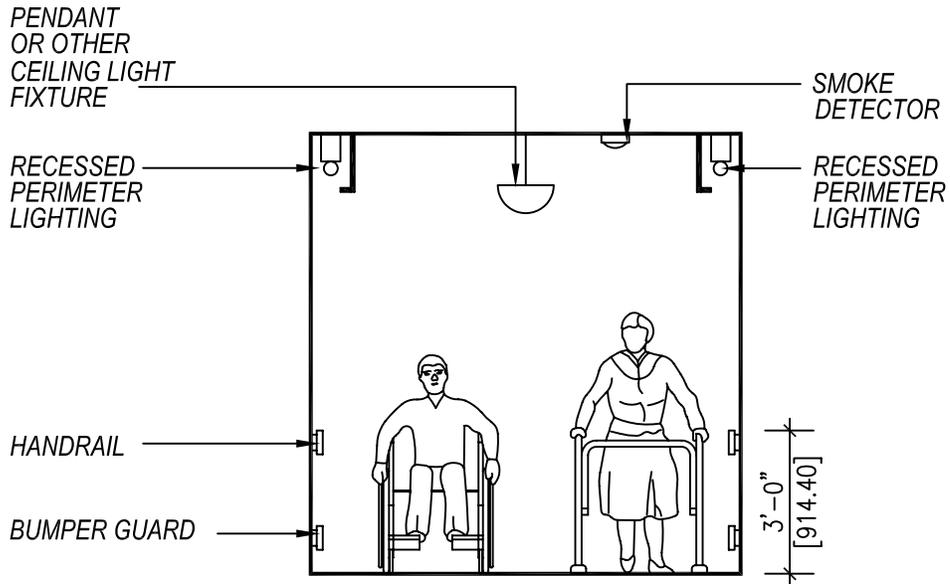
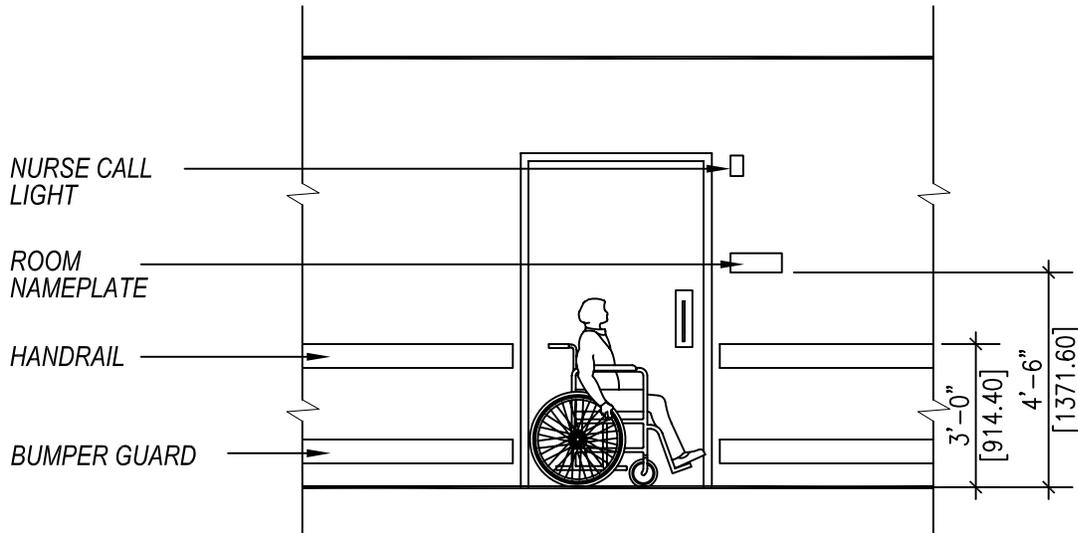
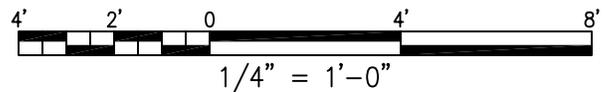


Figure 2.5.23



11. Corridor

Function:

The corridors are used by residents and staff for circulation within the facility.

Space Requirement:

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile
Base:	Vinyl
Wall Finish:	Gypsum Wallboard*
Ceiling:	Acoustical Tile
Ceiling Height:	9'-0" (8' w/wall-mount TV)
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	6
Doors:	3'-8" x 7'-0" wood or metal, optional view glass panel.
Windows:	Required by code, operable, see PG-18-3, Topic 1, Codes and Standards.

*Vinyl Wallcovering at Lavatory

HVAC:

Temperature/Humidity:	
Summer:	78° F, Max. 50% RH
Winter:	72° F, Min. 30% RH
Min. Air Changes/Hour:	N/A
Min. % Outside Air:	As per ASHRAE Std 62
Pressure:	N/A
Noise Criteria:	Max. 40 NC

Electrical:

Lighting Levels:	
Gen. Illum:	20 fc
Task Illum:	N/A
Over Bed:	N/A
Emergency	
Egress:	1 fc Ave.
Emergency Power:	
Medical Gases:	N/A
Night Lights:	Y
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	Y

12. Holding Room - 81 NSF [7.5 m²]

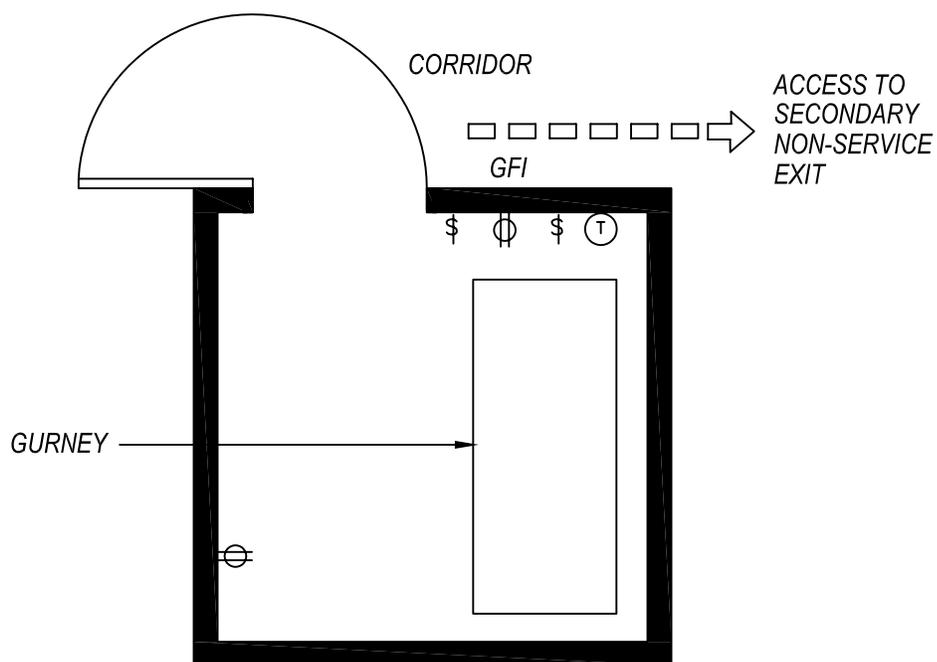
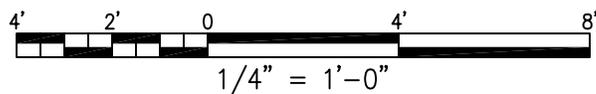


Figure 2.5.24



12. Holding Room Reflected Ceiling Plan

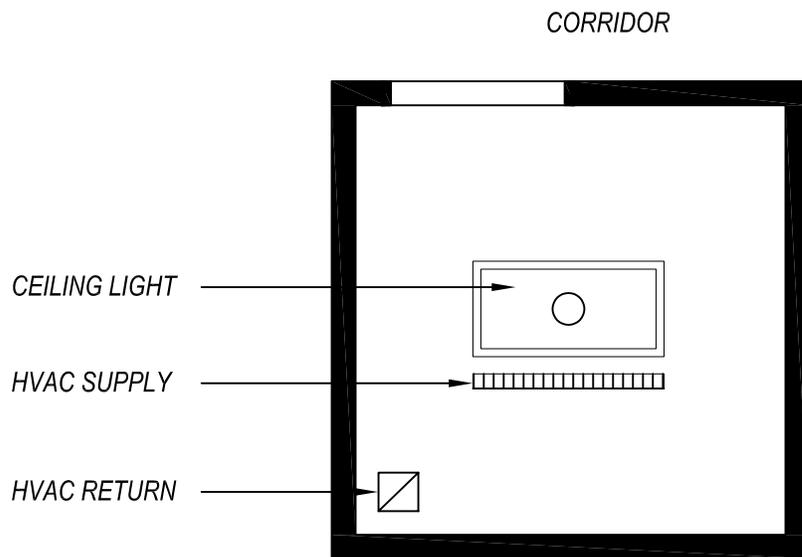
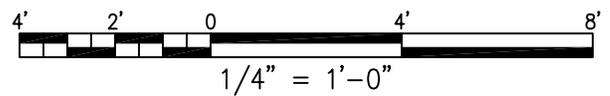


Figure 2.5.25



12. Holding Room

Function:

The holding room is used by unit staff for temporary storage of the deceased.

Space Requirement:

81 NSF [7.5 m²]

Architectural:

Finish Code:	1-A
Floor Finish:	Vinyl Composition Tile
Base:	Vinyl
Wall Finish:	Gypsum Wallboard
Ceiling:	Gypsum Wallboard
Ceiling Height:	9'-0"
Noise (STC Rating):	35
Slab Depression:	None
Special Construction:	-
Hardware:	23
Doors:	4'-0" x 7'-0" wood or metal.
Windows:	

HVAC:

Temperature:	
Summer:	
Winter:	
Min. Air Changes/Hour:	
Min. % Outside Air:	
Pressure:	
% Filtration:	
Noise Criteria:	
A/C Loads:	
Lights:	
Equipment:	
People:	

Electrical:

Lighting Levels:	
Gen. Illum:	30 fc
Task Illum:	N/A
Over Bed:	N/A
Emergency	
Egress:	N/A
Emergency Power:	
Medical Gases:	N/A
Night Lights:	N/A
Vanity Light:	N/A
One Receptacle	
per PBPU:	N/A
Nurse Call:	N/A

13. Main Entrance & Canopy

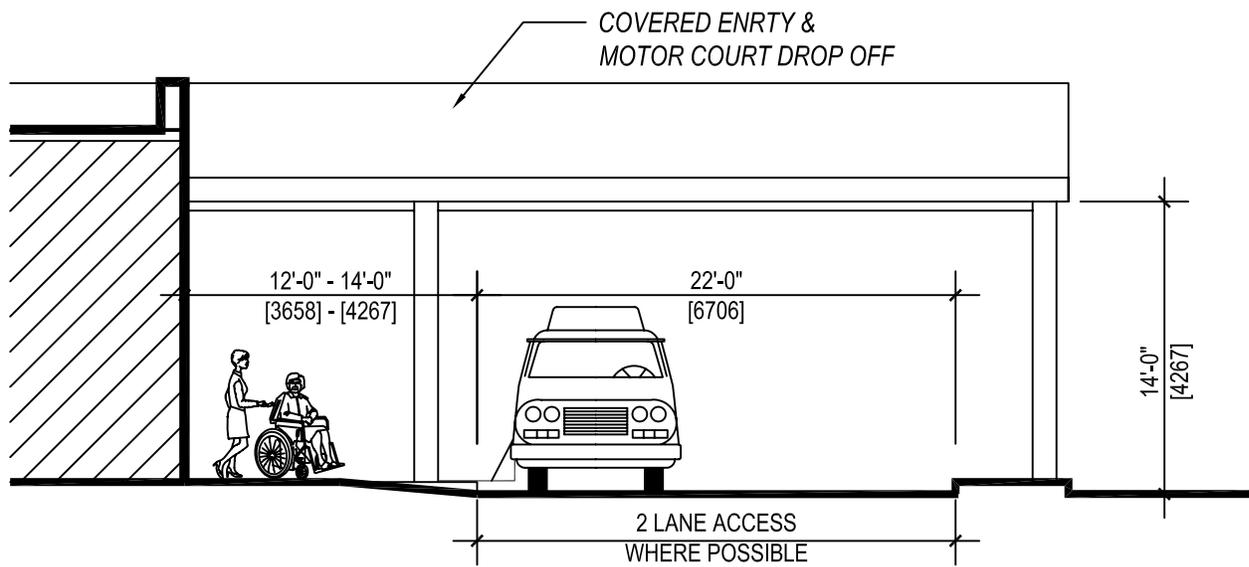
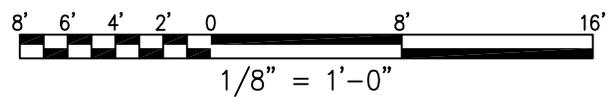


Figure 2.5.26



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3.0 PLANNING AND DESIGN DATA

3.1 Resident Bedroom

3.1.1 General

The resident bedroom has typically been utilized as an environment for private living space and personal care. It is also one of several settings that a resident will occupy each day, but the only setting where personal items may be displayed and/or stored and where privacy in personal care and/or service can occur. However, because it is bedroom space, the bedroom environment should encourage the resident, regardless of physical impairment, to remain outside of the bedroom as much as possible and utilize common living space so designed for that purpose as much as possible.

3.1.2 Planning Considerations

Resident bedrooms are the basic building blocks of a Nursing Home facility. Bedrooms and their adjacent bathrooms typically account for up to 40% of a Nursing Home's overall area. Refer to Table 3.2 "Furniture Worksheet" when beginning the planning process for a Nursing Home resident bedroom.

1. *Bedroom Design in Relation to Unit Configuration*

The resident bedroom configuration should contribute to the efficiency of the overall care unit, including the support of

efficient net and gross areas. Functional bedrooms do not diminish the need for a functional overall unit and building.

2. *Individual Private Bedrooms and Bathrooms*

The recommendation of this VA Design Guide is to provide an individual bedroom for each resident. Ideally, this room also has its own bathroom.

The resident bedroom should offer options for personalization and at the same time encourage the resident to remain out of the bedroom as much as possible. Beds and room furnishings should have a 'bedroom' rather than an institutional appearance.

The resident bedroom should reflect the personality of the occupant. The décor, the nature of the furniture, the color schemes, and space for personal items should cater to the individual needs of the resident who occupies this personal space.

3. *Bedroom Plans for Special Needs*

Variations from typical bedroom criteria and design may be indicated by a documented functional program describing special populations and their care needs. The bedroom may be arranged according to a resident's preferences and needs. The bed should function in one position that allows access for care on either side, including transfers and lift use. (See Figure 3.1) A method should be provided to keep individual possessions separate without confusion or clutter.

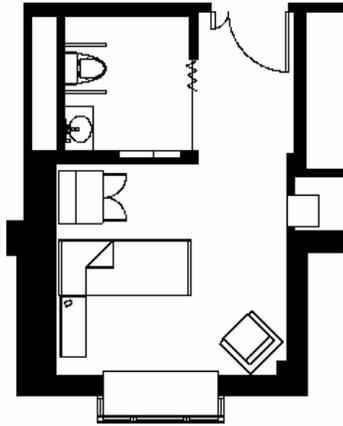


Figure 3.1

Individual Bedroom with Toilet

4. Special Sub-Population Needs

Special sub-populations may include terminally ill and bariatric clients as well as those with spinal cord injury, dementia or skilled nursing needs. These residents are defined as those requiring:

- Beds longer than 94" [2388 mm]
- Equipment for specialized care (e.g., respiratory care, spinal cord injury, or rehabilitation)
- Technology associated with palliative care
- Specified cognitive, memory or behavioral needs

5. Individual Bedrooms with Shared Bathroom

Under certain jurisdictions, requiring private bedrooms with individual bathrooms would preclude a state from developing a veterans' Nursing Home. Typical reasons for this exclusion would be per person square footage, per bed construction cost controls, or the inability to access a state's share of Medicaid reimbursement for people in single occupancy bedrooms. Therefore,

it may be necessary to consider the following:

- A bedroom that has two separate living spaces but only one entrance from the hall is deemed double occupancy. (See Figure 3.2).
- The living area for projects submitted with "biaxial" bedrooms should be functionally equivalent for each resident and be spatially comparable to any typical single occupancy bedrooms that are included in the design. (See Figure 3.3).

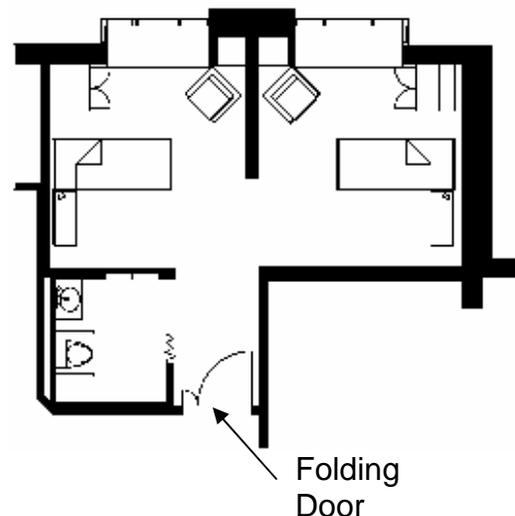


Figure 3.2

Biaxial Individual Bedroom with Toe-to-Toe Bed Placement

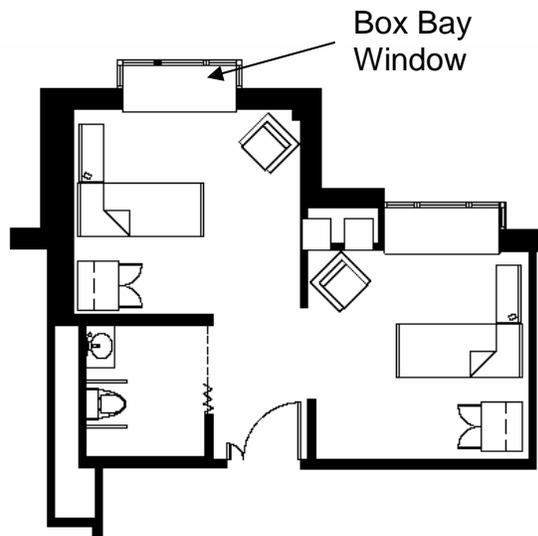


Figure 3.3

Biaxial Individual Resident Bedroom with “L” Shaped Bed Placements

3.1.3 Design Considerations

The resident bedroom should be designed to accommodate the following:

1. Resident Uses

The bedroom should provide the resident with an identifiable area for convenient use:

- Seating next to the window
- Space or other provisions for display of personal items
- Access to storage units
- Headwalls designed with sufficient space for the bedside stand or dresser to be used for residents' water and personal items
- Use of wardrobes rather than built-in units to add to a bedroom's flexibility

2. Clearances

The following are some of the clearances to consider during the design of a resident bedroom:

- Maneuvering space - 5'-6" [1676 mm]
 - Clearance at side of Bed - 3'-6" [1067 mm]
 - Clear headwall - 13'-6" to 14'-6" [4115 mm to 4420 mm]
 - Clearance at latch side of door - 1'-6" [457 mm]
- ADA, ANSI and ADAAG should be reviewed where respectively applicable.

3. Door Swing Projections

The plans should indicate accessibility of the openings and ease of door use, including plans that avoid door conflict. All resident care and circulation areas should be designed to be free from impediments such as sharp projections, including those from mechanical devices and structural elements. Controls, hardware and other built-in details should neither intrude nor compromise the overall bedroom circulation and functions of care.

4. Sinks

When two residents share a bathroom, a sink should be provided in the resident bedroom. In 2004, many jurisdictions approved the use of disposable, anti-microbial or alcohol wipes for hand washing in lieu of or in addition to sinks. Methods of dispensing these items should be included. The sink needs to be easily and equally accessible for any bedroom occupant, staff member or, visitor.

5. Medical Gases and Concentrators

The facility may be designed to accommodate in-wall oxygen and/or portable concentrators or other equipment; space for it should be

identified on the bedroom plan as required.

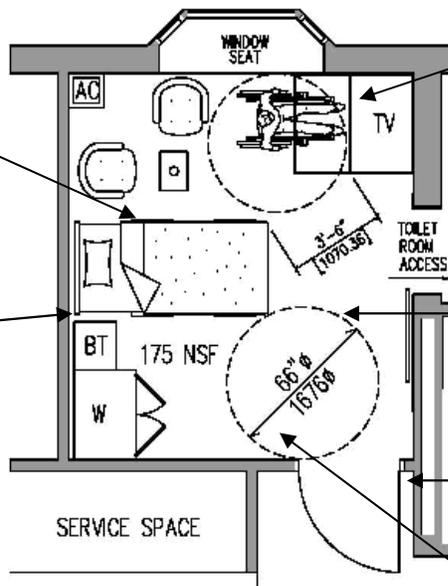
6. Resident Bedroom Module

Below are two examples of possible furniture configurations for a one bed

room. (See figures 3.4 and 3.5) Refer to Table 3.1 and 3.2 “Furniture Worksheet” as a guide when beginning the planning process for a Nursing Home resident bedroom.

87”-91” [2210 mm - 2311 mm] Bed in overall length that is adjustable in height and holds an 84” [2134 mm] mattress.

Bedside stand with lockable drawer for resident use



Optional furnishings or equipment: TV/hutch, desk, armoire or dresser. TV should be comfortably viewed from resident’s chair and bed.

5’-6” [1676 mm] Turning Radius in clinical area

4’-0” [1219 mm] Door

1’-6” [457 mm] Clearance at latch side of door

Figure 3.4

Resident Bedroom Module—Alternate Equipment Configuration #1

Visitor's chair with a floor area requirement of 23" w x 22" d [584 mm x 559 mm];

Wardrobe with 21"-22" [533 mm - 559 mm] of interior depth and 24"-42" [610 mm - 1067 mm] in width;

Note:

Doors to the room and bathroom should be integrated with room criteria for circulation and ease of use, including applicable ADA requirements for 18" [457 mm] clearance at the latch-side of the door.

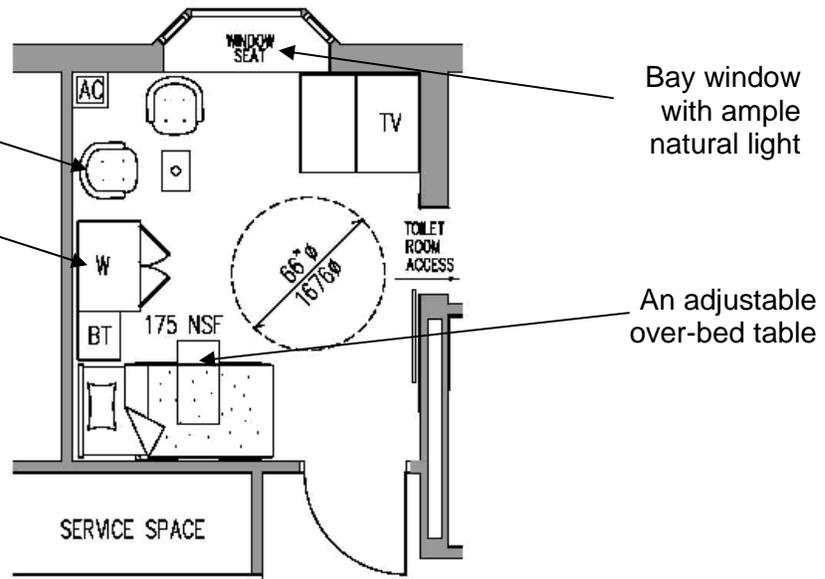


Figure 3.5

Resident Bedroom Module—Alternate Equipment Configuration #2

3.1.4 Interior Considerations

Ample natural light and window area should be provided in resident bedrooms and consistent with local regulations and geographic considerations. Natural light is associated with resident well being and should be maximized wherever possible. Varying views and window treatments help differentiate bedrooms and improve resident wayfinding.

A bay window adds to the residential appearance of the bedroom. The window does not add to floor area but it can become an added seat for visitors, a display area, a desk, or a bookshelf. This feature is typically 17" [432 mm] from the finished floor. (See Figure 3.5)

Light and windows should be designed to optimize transparency and natural light, and allow access to vistas. Bedroom plans should support the following:

- The size and location of the window accommodates furniture, furnishings, and equipment, about 18"-36" [457 mm - 914 mm] at the side(s) of the opening.
- Daylight is supplemented by appropriately located, non-glare, artificial lighting fixtures. Indirect lighting may be incorporated with sufficient ceiling heights, which is usually 9'-0" [2743 mm] minimum.
- Ambient lighting should be supplemented by task lighting.
- Ceiling, floor and/or table lights are located to balance and optimize non-

glare room illumination consistent with Illuminating Engineering Society of North America, IESNA RP-28, 1998, Recommended Practice for Lighting and the Visual Environment for Senior Living.

3.1.5 Systems Considerations

N/A

3.1.6 Miscellaneous

1. *Clinical zone*

The problem with strict application of ADA or ANSI criteria is that they compromise the residents' need to

transfer to a chair on the window side or to a wheelchair and/or lift on the clinical side of the bed. A preferred clinical access zone accommodates a 5'-6" [1676 mm] minimum turning radius. This is greater than the current minimum dimensions required by ADA's Architectural Guidelines (ADAAG, 2004).



Furniture Worksheet

	ITEM	Unit of Measure	Width		Depth Total		Maximum Height	Refer to Table FW-2	
			MIN.	MAX.	MIN.	MAX.			
1	Bed	Inches	28	36	83	97		Yes	
		millimeters	711	914	2110	2460			
2	Nightstand	Inches	20	24	20	24	30	Yes	
		millimeters	508	610	508	610	762		
3	Chest of Drawers	Inches	36		20	24	54	Yes	
		millimeters	914		503	610	1372		
4	Dresser	Inches	36	54	20	24	42	Yes	
		millimeters	914	1372	508	610	1067		
5	Wardrobe	Inches	30	42	36	38		Yes	
		millimeters	762	1067	914	965			
6	Wardrobe-Dresser	Inches	30	42	36	38		Yes	
		millimeters	762	1067	914	965			
7	Chair:							Yes	
		Lounge	Inches	31		32			34
			millimeters	787		813			864
		Wing	Inches	28		31			40
			millimeters	711		787			1016
		Recliner	Inches	28		35	62**		41
millimeters	711			889	1575	1041			
Desk or Straight Chair: With or Without Arms	Inches	20		20		35			
millimeters	508		508			889			
8	Wheelchair w/Footrest	Inches	42		26		36		
		millimeters	1067		660		914		
9	Over Bed Table***	Inches	36		18	24	46	Yes	
		millimeters	914		457	610	1168		
10	TV and Stand	To be established on site****						Yes	
11	Writing Desk or Table	Inches	48		26		30	Yes	
		millimeters	1219		660		762		

Table 3.1

Notes:

1. Identify elements that affect space: HVAC, concentrators, medical technologies, communications or other features affecting layout or dimensions (Specify for each project)
2. Bed Length includes clearance of 3" from wall for typical head board and bumper to avoid wall damage. Check foot board controls; some controls add length to the bed (not included)
- ** 3. Extended lounge chair
- *** 4. Many states do not require; improved bathroom storage has reduced use/need.
- **** 5. Wall bracket mounting used to be common; however, higher TV's are reported more difficult to see and sound control is often a problem. TV's are now often found on a dresser, bedside stand or hutch.
6. Bathroom layout and door considerations need to be incorporated into bedroom design and mechanical/electrical plans.

Complete the following based on project needs and design.

Furniture Worksheet – Deriving the Size and Shape of Resident Bedrooms

ITEM	Typical	Comments
1 Bed	<input type="checkbox"/> Typical in 87" range [2210mm] <input type="checkbox"/> All in 94" range [2388mm]	Several sponsors have been using beds with no footboard for a residential appearance
2 Bedside Stand	<input type="checkbox"/> Small; usable drawers	Some will select this in larger dresser sizes; others may use hutch
3 Chest of Drawers	<input type="checkbox"/> Not typical	May have chest as option or personal furniture from home.
4 Dresser	<input type="checkbox"/> May use night stand and wardrobe; 4 drawer	Consider seasonal and off-season storage; need for hanging vs. folded.
5 Wardrobe	<input type="checkbox"/> Larger: 2-3' [610mm - 914mm] <input type="checkbox"/> May hold TV	Closets may require sprinkler and may "fix" location of bed.
6 Wardrobe-Dresser Hutch	<input type="checkbox"/> Option; often with other dresser or drawers.	Some wardrobes do have a lower supply drawer, raising base for shoes.
7 Chair	<input type="checkbox"/> Wing or supported chair <input type="checkbox"/> May offer recliner space	Both wheelchair & chair should fit
8 Over Bed Table***	<input type="checkbox"/> Occasionally used; more likely to groom in bathroom, eat in dining	Verify its use, need. Concerns with placement; its wheels make it risky as a leaning surface for those who are confused.
9 TV and Stand or Hutch	<input type="checkbox"/> Option: on dresser or its own stand.	Wall mounted TVs have proven difficult to see; sound control and volume have been problematic in high wall mounts. Not all residents use/need a TV.
10 Writing Desk or Table	<input type="checkbox"/> Not Typical: May be option from own home See Over bed table.	Tables may be used by more robust residents
11 Wheelchair w/Footrest	<input type="checkbox"/> One side bed access + space at foot for turning for typical+oversized chair	Both wheelchair & chair should fit
Wheelchair and Lifts	<input type="checkbox"/> Include measurements & sweep	
HVAC Units Size, Projection Location	<input type="checkbox"/> Vertical fancoil or valance units not requiring floor area {insert size}	Fin tube or through wall systems under windows need to be included in floor plan studies for basic room size.
Use of Concentrators	<input type="checkbox"/>	
Medical Gasses	<input type="checkbox"/>	

Table 3.2

3.2 Resident Toilets and Showers

3.2.1 General

The VA Nursing Home Design Guide recommends a resident bedroom that has a full toilet room including a functionally accessible shower. The term “Resident Toilet Room,” in this Design Guide refers to the space adjacent to and accessed from a resident bedroom. These criteria also apply to individual toilet rooms that are designed without showers for use by residents elsewhere in the building (i.e., those near dining, activity and therapy areas and in bathing suites).

3.2.2 Planning Considerations

Resident toilet rooms for Nursing Homes require:

- Adequate lift use and transfer space requirements
- A 5’-6” [1676 mm] diameter turning radius
- Adequate space necessary for staff assistance on two sides of the toilet
- The provision for fold-up grab rails
- Adequate bathroom entrance width

These improvements are suggestions to address central issues in resident needs, Nursing Home care, safety, and operations. The resultant generates a room that may be at least 60 nsf [5.57 m²] in area without a shower.

In addition to these issues, the intent is to encourage the inclusion of an individual shower in each resident bedroom. The rationale for including a shower is to:

- Integrate personal care
- Streamline time management
- Reduce the fears and discomforts commonly experienced in communal bathing

It is recommended that 95% of the resident bedroom bathrooms are consistent with the criteria outlined in this Nursing Home Design Guide and 5% should address self-transfer as outlined in ADAAG. Functional design and safe, assisted toileting should be available for toilet rooms adjacent to resident bedrooms and those used during dining, therapy, activity, or bathing.

1. Assisted Bathrooms

The bathroom configuration criteria has been developed to better address assisted transfer and lifts to benefit residents and contribute to staff safety. For Nursing Homes, functionally accessible bathrooms accommodate a resident, a device such as a wheelchair/lift, and staff members for safe transfer.

2. Statistics on Toilet Assistance

National data indicate that 76% of all Nursing Home residents have limitations affecting their independence in toileting; 24% toilet independently. In general, 50-58% of Nursing Home residents are incontinent.

Additional data showed that about 71% of Nursing Home residents have difficulties related to transfer. Typically, 1-2 staff members assist 39-42% of residents. About 29% are fully dependent during transfer.

3. Cost Incurred

Managing incontinence costs and staff injuries is a major objective for improved Nursing Home bathroom design.

Nationally, the cost of incontinence care is estimated at \$4.3 billion. Costs related to staff injury are involved also. Each year, about 18% of all Nursing Home workers are injured or become ill on the job. Eighty-one percent are back injuries, occurring during the lifting and turning of residents.

The Nursing Home industry paid close to \$1 billion in workers' compensation insurance payments in 1994.

4. Planning for the Residents

Individual bathrooms for each person are preferred based on best practices in continence care and hygiene as well as to minimize issues in roommate matching. No more than two residents should share a toilet room, if sharing is required.



Figure 3.6

Bathroom Entry Maneuverability Challenges

- **Bathroom Entry**

The clear width of the toilet room entrance needs to accommodate the

resident, whether independent, assisted, wheeling or wheeled, as well as his/her elbows and wheelchair foot support. Residents in wheelchairs with foot pedals or extensions need to be able to operate the door. (See Figure 3.6)

- **Clear Space**

Clear circulation space should be included in the toilet room to provide ease of movement for residents, who use devices independently, or those needing assistance and equipment.

- **Privacy**

Privacy is an entitlement. Residents should not be subject to indignities while being transferred, hoisted, toileted, or showered. Bathroom location, door selection, and the ability to respond to the residents' needs behind closed doors all contribute to respect for individual privacy.

- **Overall Fixture Use**

Residents should be able to utilize the toilet, sink, room supplies, and door with minimal repositioning. Generally, this is most effectively satisfied when both toilet and sink are on a back wall, facing the entry.

- **Showering**

The typical resident should be able to receive an assisted shower in his/her individual bathroom. Due to issues of balancing and pivoting, as outlined above, the individual should be able to receive this shower from a secure shower chair rather than a bench.

- **Self-Toileting**

For residents who propel themselves, toilet room design should accommodate items identified on Table 3.3.

- *For Staff Assistants*
Residents are transferred by either one or two assistants, who should be able to assist weight bearing residents with transfer and safe lift use.
- *Door Operation and Entry*
Staff should be able to open the door in a safe and efficient manner and close it prior to toileting a resident. The entry should be wide enough to allow staff to push the resident in, move around beside the resident in the wheelchair, and close the door before providing transfer assistance.
- *Assisted Transfer of Weight-Bearing Residents*
Open space should accommodate a safe initial wheelchair position in preparation for transfer, sufficient area for both the resident and staff to safely stand, and open floor area for the resident to pivot onto the toilet. Staff should be able to assist residents onto the toilet, unimpeded. Floor area should allow the chair to be wheeled diagonally to the toilet, permitting sufficient floor space to stand.
- *Accommodating Mechanical Lift Action*
Use of lifts in closed and open positions and space for staff footwork must be accommodated within the closed bathroom space. The lift should be within easy reach while the resident uses the toilet. Staff should not be required to hoist or lift the backs of wheelchairs.

5. Staff Assisted Transfers

During lift or wheelchair use for each type needed, staff should be able to do the following:

- Stand with feet apart and securely bend in the floor area, free of encumbrances from base cabinets, floor mounted rails, projections from the toilet, or obstacles from walls, rails, vanity tops or other fixtures;
- Get by the resident and/or device in order to perform personal care;
- Use sanitary products, hand-wash, bag and dispose waste, and operate the door with minimal repositioning of the resident, lift or wheelchair. (See Figure 3.7)



Figure 3.7

Assisted Toilet Transfer Challenges

6. Materials Management

Necessary cleaning supplies should be conveniently stored in secure areas. Staff or residents should be able to appropriately dispose of soiled items, such as in plastic bags, without placing goods or matter directly onto any surface. Soiled items should be stored in appropriately covered containers in areas off the main corridor.

3.2.3 Design Considerations

Many authorities and regulators are familiar with ADAAG and ANSI A117.1, which focus on self-toileting. A number

of design features are identified herein that address issues of Nursing Home residents and of the safety of staff assistants. Several of these may require advance review with or approval from authorities with jurisdiction over the proposed Nursing Home. To benefit both residents and staff, project design teams are advised to address these issues early in project planning.

1. *Application of ADA Architectural Guide (ADAAG)*

Strict application of State Building Code's ANSI A117.1 would require an 18" [457 mm] dimension from the center line of the toilet to the face of the side wall. Such interpretation responds to research involving wheelchair occupants, typically those with upper body strength, not unlike that of robust younger veterans, and the potential needs for a self-propelled, side or parallel transfer or similar maneuver. Such individuals should be accommodated, as should the predominant population of Nursing Home residents such as those needing space for staff assistance at either side.

The dimension of approximately 2'-8" [813 mm] from the centerline of the toilet to the sidewall or other obstruction (such as the edge of a sink, vanity or tissue holder) allows space for a standing staff member, wheelchair or lift. This will exceed the 18" [457 mm] requirement but allows space for the standing and bending of assistant(s) and the use of lifts.

Grab-rail needs of residents should be met with fold-up bars, which provide flexibility for staff and residents to use a variety of transfer methods and devices. (See Figure 3.8)



Figure 3.8

Fold-up Toilet Room Grab Bars

2. *Design Issues for Jurisdictional Review*

- *Toilets*
This Design Guide includes illustrations showing flush-valve toilets. In some jurisdictions, and where available water pressures allow, tank-style toilets may be considered in order to provide quieter operation and a more familiar and residential appearance. Wall-hung, tank-style toilets with back outlets are available, thus maintaining housekeeping goals, including easy access for floor cleaning under and around the fixture, without compromising objectives of non-intrusive toilet use by other residents.
- *Omission of In-Room Bedpan Washing*
Due to low volumes of use and disposable alternatives, requests are commonly made to omit bedpan washing and sanitizing facilities in resident bathrooms. Standard

bathroom bedpan equipment often results in unhygienic splatter or splash. Washing and sanitizing equipment can be inadvertently grabbed or used by residents. Such equipment is also inconsistent with goals of a residential model.

Where permitted by local codes, bedpan washing and sanitizing facilities may be included in a conveniently located soiled utility room. This is suggested as an alternative to being located in the resident toilet room. Provisions should be made for bedpans to be appropriately covered or bagged and sealed for safe removal.

- *Use of Fold-Up Grab Bars*
To accommodate lifting and transfers, securely mounted, wall hinged, fold-up bars should be installed to individually and safely swing up or out of the way. Use of fold-up grab bars may need to be approved by local jurisdictions, particularly those applying state codes based on ANSI A117.1. The justification for applying for use of fold-up bars is to meet the functional needs of both residents and staff. Structural security and safety is of concern to many review agencies and should be reviewed with both the manufacturer and construction team, all of whom should be made aware of the heights and weights of the predominantly male veterans, as well as the care giving staff, who will use them.
- *Shower Chairs in Lieu of Fold-up Benches*
Use of shower chairs is the preferred method of showering for the typical Nursing Home resident, to allow repositioning and to increase the

safety of both the resident and the assistant. ADAAG recognizes the use of shower chairs in medical facilities. The Access Board has pointed out, for purposes of interpreting ADA, which Nursing Homes are a subset of “medical facilities.” Provision of shower chairs rather than benches is consistent with ADAAG and should be provided in bathrooms in both resident bedrooms and bathing suites.

- *Omission of Back-Wall Grab Bar*
Where permitted, the grab bar at the back wall may be omitted, if the fold-up side rails can be locked in an upright position and held for toileting when facing the toilet.
- *Floor Drains*
If permitted by applicable codes, the resident toilet room may include a floor drain. Unless they are used periodically, floor drains may require regular maintenance to avoid problems of odor and sewer gas build-up. Methods for achieving proper maintenance may need to be indicated during plan review. The resident’s handheld shower may be helpful in drain maintenance.

The combined impact of space, fixture placement, door design, and rail placement and selection should be carefully coordinated to respond to movement, assistance and safety needs. Each resident should have immediate access to a toilet room from the resident bedroom without having to move through a public corridor.

- *Fixtures and Equipment*
Fixtures should be selected and placed to accommodate the sweep of a minimum diameter of 5’-6” [1676 mm] three-point turn for suitable

mobility device(s) needed by the residents. Fixtures and equipment should include the following items:

- A toilet, a sink suitable for resident and staff hand-washing, and facilities for hygienically dispensing clean supplies and for soiled matter collection
- Hardware, or a system for assisting transfer, such as grab bars and lift or equivalent technologies
- A communication system, designed to be accessible to the user in a variety of positions, including from the toilet, sink and floor
- A mirror that is usable from a wheelchair as well as by staff to assist in grooming
- Accommodations as needed for individual or compact, fracture-style bedpans
- Operable door, preferably surface-mounted and not in-swinging

3. Clearances and Floor Area for Toilet Placement

The basis for estimating space clearance on either side of the toilet should include the following considerations:

- 18" [457 mm] should be allotted from the centerline of the toilet to the grab bars for Nursing Home residents capable of self-transfer from wheelchair and toilet, which allows sufficient space for grasping and leaning on the grab bars provided.
- For residents requiring assistance, incorporate space for one or more staff assistants to stand safely bend and to maneuver a lift next to the

toilet with at least 18"-20" [457 mm – 508 mm] clear on the wall side.

- When the sink and toilet are on the same wall, there should be a clear space between the sink or vanity edge and the side of the toilet, 18"-20" w x 18"-20" d [457 mm – 508 mm x 457 mm x 508 mm] (extending from the back of the toilet seat to its front). Both sides of the toilet need to be available for transfer assistance and positioning. The zone(s) for staff to stand should be indicated on the bathroom plans. Alternative fixture placements may be proposed if it can be demonstrated that the space and configuration accommodates one- and two-person transfers, as well as appropriate lifts, and for staff assistance on either or both sides of the toilet.

4. Fixture Heights and Features

A toilet seat height of 16"-18" [406 mm – 457 mm] above the finished floor should accommodate safe transfers. It may be necessary to customize toilet seat heights for certain users to correspond to wheelchair seats and/or accommodate different physical needs. Toilets are now available with easily adjustable seat heights, which benefit both self- and staff-assisted transfers.

While flush-valve toilets are prevalent in institutional settings, tank-style toilets provide quieter operation and a more familiar and residential appearance. Toilets should flush effectively while meeting applicable water use standards.

Toilets should be selected to permit easy access underneath for floor cleaning.

Fold up grab bars can now be adapted after installation to suit users' preferences. Some require space for mountings along the back-wall to provide necessary channels and locking.

When a toilet room is being designed to accommodate self- and staff-assisted transfers, the critical dimensions can be met with fold-up bars as follows:

- For a resident, grab bars are mounted on both sides of the toilet at 16" -18" [457 mm – 508 mm] from the center line of the toilet to the center line of the grab bar.
- The stand-by space for assisted transfer between wall and grab bar is a minimum of 1'-4" [406 mm] when the grab rail is down and 2'-8 to 2'-10" [813 mm – 864 mm] when the grab rail is up.
- Bars should be mounted so that the top is 2'-10" [864 mm] from the finished floor; some models are adjustable in height.
- Grab bars should project to the front edge of the selected toilet in order to permit the resident to hold on while leaning forward to maintain a low center of gravity.
- Fold-up bars average 2" [51 mm] in width and project about 29" - 33.5" [750 mm - 850 mm] from the back wall.
- The specific length of the bar will depend on such considerations as the choice of fixture, either tank-top or flush-valve, and toilet bowl, either traditional round front or elongated.
- Projecting mechanical chases and structural columns should not compromise the placement of fold-up grab rails or the space available for staff to stand alongside the toilet.

- Toilet paper can be located either on the grab bar or on accessible hardware that is suspended under the sink.
- Powder coated bars may be easier to grip than those of knurled steel.

5. Sinks, Faucets, and Water Control

• Sinks

A sink should be provided in each resident toilet facility. The sink should be easily approached with clear space for knees and feet. Neither knees nor legs, including those supported by wheelchair footrests, should come in contact with pipes. Sink and plumbing may meet these objectives by specifying back outlet drains or other means of keeping plumbing from projecting forward.

• Hot Water

Hot water drawn from faucets used by residents should not exceed 110 degrees fahrenheit. Central mixing valves, leading to branch circuits, may be preferable to local mixing valves at each sink. This should protect residents from contacting excessively hot water supply lines and also reduce maintenance and insulation problems.

• Faucets

There is some indication that individual controls for hot and cold water are less confusing and usable by more people than single handle controls. Slightly extended blades for water control will satisfy most resident needs. Longer wrist extenders are available for customizing controls to particular hand use requirements. Faucets should be 16-18" [406 mm – 457 mm] from the person due to typical reaching requirements.

- **Vanities and Mirrors**
The mirror should meet the sink or a splashguard at the back of the sink counter. Such designs will improve clean up. The countertop should have rounded rather than sharp edges.

6. Doorway Criteria

The clear width of the toilet room entrance needs to accommodate staff movement from behind the resident to a safe footwork zone for transfer. This typically requires openings that are wider, to yield to both resident and staff. Clear openings of 4' [1219 mm] or more allow sufficient space for elbows, especially when a direct entry is unlikely due to the encumbrance of vestibule walls. A 32" [813 mm] clear opening is typically insufficient. The average wheelchair, if correctly aligned, may be pushed through a clear opening of 32" [813 mm] as required by the ADA. The necessary opening should permit realistic routes of a self-propelled or assisted resident from a bed or hall, which may involve a sweeping turn or less than perfect alignment. It is preferable that typical resident toilet rooms should have only one entry to respond to privacy needs and problems of intrusion.

In an open position, the resident bedroom door should not cover or impede access to the entry of the resident bedroom toilet.



Figure 3.9

Wide Opening to Resident Toilet Room
The Highlands, Wyomissing, PA

Sliding doors tend to facilitate resident use. (See Figure 3.9) Solid doors that swing toward the resident conflict with lower extremities and wheelchair movement; doors that swing away from the person are difficult to reach and control.

To develop clear openings of 4' [1219 mm] or more, secure and sturdy, surface-mounted sliding or folding doors may be used. Such doors should have emergency access features. It should be possible for toilet room doors to be opened to provide assistance for a resident who has fallen or might be wedged against the door. Sliding the door on the outside of the bathroom may be preferable to interior or "in-wall" sliding or pocket doors. In-swinging doors may be used only if reverse-swinging safety latches are provided.

Sliding doors should open against a length of clear wall space sufficient to stack the width of the door. Hollow, paneled sliding doors are preferable due to their stability and weight.

Sliding or folding doors should be securely mounted, typically suspended from the top with no floor track across the opening, made of durable materials, with easy-to-maintain hardware. In its open position, use of electrical outlets or other utilities should not be blocked. Refer to section 3.4 of this Design Guide for common ways of arranging pairs of bedrooms and bathrooms to accommodate door stacking and implications for typical resident bedrooms of varying sizes and configurations. Sliding and folding doors should provide privacy with an appropriate acoustical seal that fully covers the opening.

Doors, hardware, and hardware mounting locations should be selected for convenient resident and staff use.

Hand grips should be provided at 29" - 34" [737 mm – 864 mm] from the finished floor so that they can be used by standing or seated residents. Appropriately located door pulls will reduce maintenance problems associated with the sliding tracks.

7. Showers in Resident Bathrooms
Showers should be included in the resident toilet room design. (See figure 3.10) If included, the functional program should relate the assistive characteristics of residents to the shower design features in relation to size, area for assistance, and accessibility.

- **Floor Area**
The floor area sufficient for a resident seated in a shower chair and a staff assistant is 5' x 4' [1524 mm – 1219 mm] if the adjacent bathroom floor area can be used for

staff footwork and lifts. There is typically a proportion of Nursing Home residents requiring supine positioning and other residents whose needs and preferences may not be met by the space and features of the typical resident bathroom fixture.



Figure 3.10

Resident Bedroom Bathroom, Open Plan Shower

Wavery Health Care, New Canaan, CT
Photo credit: John Leffers, Lancaster, PA

- **Shower Chairs**
Showers should be designed with space for resident to be seated in a repositionable shower chair with armrests on either side rather than on a fixed bench, which limits resident stability and staff access for assistance. If fixed seating is required in a jurisdiction, the space should be planned so that a sturdy rolling shower chair may be used when the bench is folded up. If shower chairs are to be used, they may be considered “movable health care equipment” and should appear as such in the project submission and budget.
- **Shower Fixture**
The shower fixture itself should accommodate standing, seated, and

assisted showers, e.g., a handheld or “telephone” style shower head and hose. Staff assistants should be able to safely shower a resident without dousing themselves in the process.

8. Drains and Floor Safety

Methods employed for keeping the floor safe and dry should be indicated on the plan and typically include the following:

- Water should drain to the rear of the shower or away from footwork zones of the toilet room floor. The floor may gently slope to the back to keep water from flowing to resident and staff circulation areas.
- The transition from the room’s dry floor to the shower’s wet floor should be designed to direct water flow to the drain and restrain it from the dry areas.
- The shower floor should be non-slip, preferably of an easy to clean, seamless rubber or equivalent material. Some materials are suitable both for room and shower floor use.
- Fixtures should have a shower hose that will reach diagonally across the shower space and/or around a seated occupant. Problems of dropped devices and related water spills on the room floor can be avoided.
- Shower curtains should be used to keep water within the shower instead of splashing onto floor.

9. Closures and Mountings

For the typical shower in a resident bedroom, the closure should allow the resident and caregiver open access to the space available rather than separate resident from staff. Closures should not

impede access to room ventilation. Curtains are preferable to rigid doors. The option for a ceiling track rather than shower rod may provide easier maintenance and address potential hazards posed by shower rods.

10. Temperature Control

In addition to scald control in the facility-wide plumbing system, scald control should be provided in the shower, preferably on a wall and on the handheld shower device. Fixtures and temperature controls should be available to residents and staff assistants’ at the most open or accessible “front” entry point to the shower. The objective is for controls and showerheads to be used both by capable residents and by assistants.

11. Grab Bars in Showers

Grab bars should be provided at the entry of the shower in the most accessible location and along the back and side walls. (See figure 3.11).



Figure 3.11

Shower Designed for Assistance
Moorings Park, Naples, FL;

3.2.4 Interior Considerations

1. Lighting

Large, diffused lights, rather than point illumination sources, are recommended. Lighting for grooming at sinks should be 600 lumens or 60 foot candles, with overall room illumination at a minimum of 300 lumens and 30 foot candles.

- Lighting levels for the shower should achieve a minimum of 300 lumens or 30 foot candles.
- For skin care tasks, preferred levels should be 600 lumens and 60 foot candles.
- Consider a vapor proof fixture to illuminate the shower.
- Night light should be provided to draw attention to the location of the toilet room and should be shaded by using louvers.
- Non-glare, matte finishes should be used in the bathroom to diffuse reflected light.
- Natural lighting should be maximized wherever possible.

2. Housekeeping

The following guidelines address proper facility upkeep.

- Toilet room cleaning may be hindered by:
 - Fixtures and finishes that trap soil
 - Toilets that do not completely flush
 - Toilets that are floor-mounted rather than wall-hung
 - Toilet rooms lacking appropriately designed floor drains
 - Undersized toilet rooms, which result in more floor clean-up

- Appropriately dispose of linen and waste with minimal travel to central unit areas.
- Identify and resolve the source of foul odors. It is not acceptable to mask odors that indicate underlying health problems. Avoid the following conditions:
 - Hydrophilic floor surfaces such as ceramics and some installations of vinyl composition tile (VCT) tend to absorb foul substances and release odorous bi-products from microbial growth. It is advised to seal floors with an appropriate polymer prior to applying VCT to reduce odor problems.
 - Grout or other labor-intensive hydrophilic or heavily creviced surfaces must be maintained by deep cleaning to reduce dried matter and mitigate odors.
- Appropriate fixtures and finishes to encourage efficiency:
 - Continuous surfaces and durable wall treatments tend to be easier to maintain providing that there is one floor surface for toilet room and a shower.
 - Changes in finishes typically require distinct cleaning techniques or chemicals.
 - Staff should not need to kneel to clean bathrooms.

3. Storage and Materials Management

Storage should be provided for each resident's grooming items and care products. If the toilet room is shared, individual and separate storage should be provided for these grooming items. Storage may be located in the toilet room or in another location such as in a basket kept in each resident's wardrobe.

Clean, disposable products, including bedpans, may be stored in the toilet room or other identified space. If storage is provided for clean incontinence products in the bathroom, the width should be sufficient to hold stock products. This results in approximately 10" - 18" [254 mm – 457 mm] of additional depth.

Identify facilities for sanitary use of portable urinals and bedpans in design plans. Clean pre-packed items may be stowed in stock brackets, under the sink, or in built-in storage units.

3.2.5 Systems Considerations

N/A

3.2.6 Miscellaneous

1. *Charts and Tables*

Alternative bathroom configurations, proposed for typical residents, should address the proportion of residents who will use the alternative and respond to the criteria discussed in Table 3.3.

Checklist of Equipment and Users to be Accommodated

Bathroom Users	No Device	Walker, Wheeled Walker	Standard Wheelchair	Oversized Wheelchair: Electric or Wide Manual	Battery Operated Mobility Cart	Standing Lift	Seated Lift
Individual Resident	√	√	√	√	√	N/A	N/A
Resident and One Assistant	NA	√	√	√	√	√	√
Resident and Two Assistants	NA	√	√	√	√	√	√

Table 3.3

Criteria to Encourage Self-Toileting Checklist	
<i>To promote self-toileting, resident bathrooms should address the following:</i>	
<input type="checkbox"/>	Entry, Turning and Open-Space The resident should be able to wheel in forward to an open zone of space for transferring. The resident should not have to back out.
<input type="checkbox"/>	Balance Residents' balance and secure positioning are improved with two-sided grab rails meeting both jurisdictional requirements and the actual weight bearing needs of the user.
<input type="checkbox"/>	Transfer Space is available for the resident's foot work and footrest use, enabling the resident to conveniently rise up from and get back into their wheelchair.
<input type="checkbox"/>	Handwashing Sufficient space permits a resident to transfer with minimal repositioning and maneuvering. In addition, it must be possible to streamline access from toileting to handwashing.
<input type="checkbox"/>	Reach Residents should be able to reach faucets, soap dispensers, paper towels, and to appropriately use their individually-stored grooming supplies.
<input type="checkbox"/>	Personal Grooming and Skin Care Residents should be able to see in mirror to either groom or advise staff assistants. As this involves different eye levels, an elongated mirror is usually preferable to a tilting mirror.
<input type="checkbox"/>	Disposal Disposal facilities should be available for use by the resident engaged in self-care.
<input type="checkbox"/>	Privacy Door opening and closing should be possible from the wheelchair.
<input type="checkbox"/>	Side Transfer Option Those residents preferring or needing to back in and make a side transfer should be accommodated (see Mace, 1991).

Table 3.4

3.3 Bathing Suites

3.3.1 General

Consider the following planning and design factors when choosing to incorporate a bathing suite into a Nursing Home facility.

3.3.2 Planning Considerations

Bathing is a very personal experience. Studies have found that when the bathing suite is recognized as a safe place, and where comfort and hygiene are provided in a respectful manner, resistance is significantly decreased. Therefore, in addition to technical considerations, the bathing suite should reflect a “spa like atmosphere” or an atmosphere as close to a home-like bathing suite as possible. The décor, furnishings, interior surfaces, and color therefore should appear as deinstitutionalized as possible.

Challenges include:

- Space limitations
- Fear of falling
- Anxiety related to lifting (particularly mechanical lifts that raise the person up and over a tub)
- The impact of other room apparatus and stored items
- Temperature fluctuations
- Water sprayed in the face
- Unfamiliar appearance of the room and ambient noise.

1. Bathing Suite Operations

Typical resident functions within the bathing suite include:

- Assisted showering and/or self-showering with “stand-by” assistance

- Assisted tub bathing, including lift use
- Grooming and hygiene
- Toilet transfer assistance
- Relaxation and healing
- Storage of personal products

Typical staff functions within the bathing suite include:

- Assistance in the hygiene and grooming of residents
- Skin care
- Weighing of resident
- Sanitation of tub or shower used and clean-up between each resident user
- Maintaining personal safety for each resident
- Water management design concerns, which include drainage, floor contour(s), and selection of floor materials.

2. Preferences

Tubs go unused when staff assistants are unfamiliar with tub operation, when re-fill or clean-up is time-consuming, when staff members feel unsafe during lift use, and when lifts are mismatched to the tub. Consider the following:

- Assisted tubs may be preferred for residents uncomfortable with water splash and spray or with the confining walls of a shower.
- Tubs may be preferable for the care of large residents and those with bariatric related needs. Tub use may decline when the capacity for balance and cognitive functions lead to care plan changes.
- Each typical Nursing Home resident should have convenient access to an assisted tub and a functionally accessible shower designed with

space for safe staff assistance, preferably located near to his/her living space.

- Showers in bathing suites can provide space not readily available in resident bathrooms. These showers should accommodate larger width shower chairs, individuals requiring leg extensions on wheelchairs, and supine showering such as for spinal cord injury patients. (See Figure 3.12)



Figure 3.12

Open Shower in Bathing Suite

NY State Veterans Home at Montrose, NY.

- In addition to bathing, some tubs may be used for comfort, agitation reduction, and vestibular stimulation provided through options such as bubbling from water jets.

3. Fixtures per Nursing Care Unit

Bathing requirements are set forth in regulations in terms of fixtures such as the shower head(s) or tubs rather than the rooms per number of residents. Regulations set minimum guidelines of one fixture for each 16 to 20 people. A room may have more than one fixture providing a choice of features.

4. Applicability to Nursing Homes with In-Room Showers

Shower fixture requirements usually refer to buildings equipped with resident toilet rooms without showers and may be relaxed when functionally accessible showers are provided in individual resident bathrooms.

5. Lift Use

Due to staff injuries and the operational costs of such injuries and absences, the prevalence of mechanical lift use is increasing. As of 2004, OSHA had legislation pending, which project sponsors should verify, that may establish additional criteria for lift use and/or design. In addition to government websites, refer to sites maintained by professional organizations for Long Term Care such as AAHSA.org and AHCA.org and the references for this chapter.

3.3.3 Design Considerations

1. Fixtures and Space for Use

A basic bathing suite includes the following:

- Assisted shower for use while seated, standing or in a supine position
- Tub designed for lift use
- Lift(s) designed for a specific tub and used for transport
- Functionally accessible toilet and sink
- Space necessary for staff and residents' movements in transfer
- Clean linen, soiled linen, trash and storage
- Accommodations for individual personal care items.

2. Common Options

Consider a more residential approach including some of the following:

- A grooming center or vanity, mirror, power for dryer and shaver
- Wheelchair scale and/or other methods for weighing residents
- Cabinets for personal items
- Space for hanging robe, personal clothing or cover.
- Wheelchair storage/parking
- Wheelchair hair washing facilities for persons who do not use the central facility.

3. Full-Assist Showers in Bathing Suites

Bathing suite showers should be designed to accommodate needs that cannot be readily met in typical resident room showers. Typically, a 7'-6" x 7'-6" [2286 mm x 2286 mm] or equivalent floor area will accommodate:

- A resident, seated in a shower chair, and a staff assistant
- The space necessary to move the resident
- Space for the assistant to circulate around the person being showered.

4. Assisted Tubs

Specific tubs and their lifts must be selected prior to establishing room layout.

5. Lift Use

Bathing suite dimensions should accommodate the base of each lift, which may have "closed" and "open" positions, and footwork room for the resident and one to two staff members. Mechanical lifts have increased in popularity, particularly where the resident is larger than the staff member

and/or only partially able to bear weight. Space for lift access and staff assistance should generally be accommodated in Nursing Home bathing suites. Lift features and sizes vary and include mobile versus fixed equipment such as lifts attached to specific tubs. Dimensions of several models should be accommodated in the design:

- Hydraulic and manual standing lifts
- Hydraulic and manual seated lifts
- Supine bath transfer systems
- Shower chair to minimize the need for pull-down benches and lift combinations

Best practice has been to minimize use of lifting methods that elevate or suspend residents into the air. No one method appears to satisfy all resident needs due to factors such as overall weight and size as well as their weight bearing capacity as well as ergonomic preferences of the caregiver(s). Design teams are urged to obtain experienced professional input on specification, to ensure that the lift supports the types of residents to be transferred in veterans' homes while minimizing staff risks.

6. Basis for Establishing Clearances Needed for Lift Use

Lift clearances should be based on equipment for bathing and options for transfer. Bathing lift examples and sizes appear in several websites. Illustrations of lift space can often be found in manufacturer's brochures. However, information on required clear floor space may have to be directly requested from the manufacturer.

Sponsors are strongly advised to accommodate a space of about 7'-2"

[2184 mm] for supine and some standing lift systems. The average space recommended for supine lifts is 30" w x 75" l [750 mm x 1900 mm).

7. Bathing Suite and Shower Floor Drains and Slopes

Water management is a perpetual concern, as its control can minimize hazards and falls. Floor drains are recommended for rooms that have showers or tubs. Four-inch drains should be used to accommodate unplanned incontinence with largely perforate face plates that enable staff to wash any fecal matter into the drain with a handheld shower head.

In showers, drain the water to the rear of the shower and/or away from footwork zones. The floor may gently slope to the back to keep water from flowing to resident and staff circulation areas. Two drains provide a flatter and more secure area for shower chairs as well as level space for staff to stand while providing assistance.

8. Grab Rails

Grab rails should be provided at the entry of the shower in the most accessible location, preferably near the shower head. Vertically mounted "zigzag" or "W" style rails may provide support options for standing, leaning from and sitting in this location. Horizontal rails are to be placed along the back and side walls at a height of 39" - 42" [991 mm – 1067 mm] from the finished floor, unless otherwise specified through local codes and ordinances.

9. Closures

Shower curtains should be used rather than rigid doors. Shower curtain hardware should be mounted to

accommodate both resident and staff, including the use of showering equipment.

10. Hot Water

Store hot water at 140°-160° F. Refer to Section 2.4 Systems Criteria for information on water storage and mixing valves.

11. Bathing Suite Layouts

Figure 3.13 offers an example of a common bathing suite with shower and tub, although it could be modified. The diagram illustrates:

- Shower zone (7'-6" x 8'-6") [2286 mm x 2591 mm] with diagonal opening for easy assistance, whether the resident is standing, seated, or supine on a shower trolley. A handheld shower is included.
- In tub zone, 5'-6" [1676 mm] turning radius for assistive device.
- A bathing zone of 8'-6" x 12' [2591 mm x 3658 mm]. For this diagram, assisted recumbent tub dimensions and characteristics were used.
- An open resident toilet room and vanity is shown with a headwall of about 8' [2438 mm]
- A soiled linen storage room is shown, about 49 nsf [4.55 m²], with separate containers for flat linen items, incontinence products and personal clothing and trash.
- Storage of 2' x 4' [610 mm x 1219 mm] is provided in full-length cupboards.
- For equipment, about 42 nsf [3.90 m²] is provided including an alcove for using and storing a wheelchair scale as well as an area for lift storage and recharging.

- A seat may be available for use while dressing. Mirrors for grooming are located over the sink, and a full-length mirror is inside a cupboard door. (See Figures 3.13, 3.14 and 3.15).

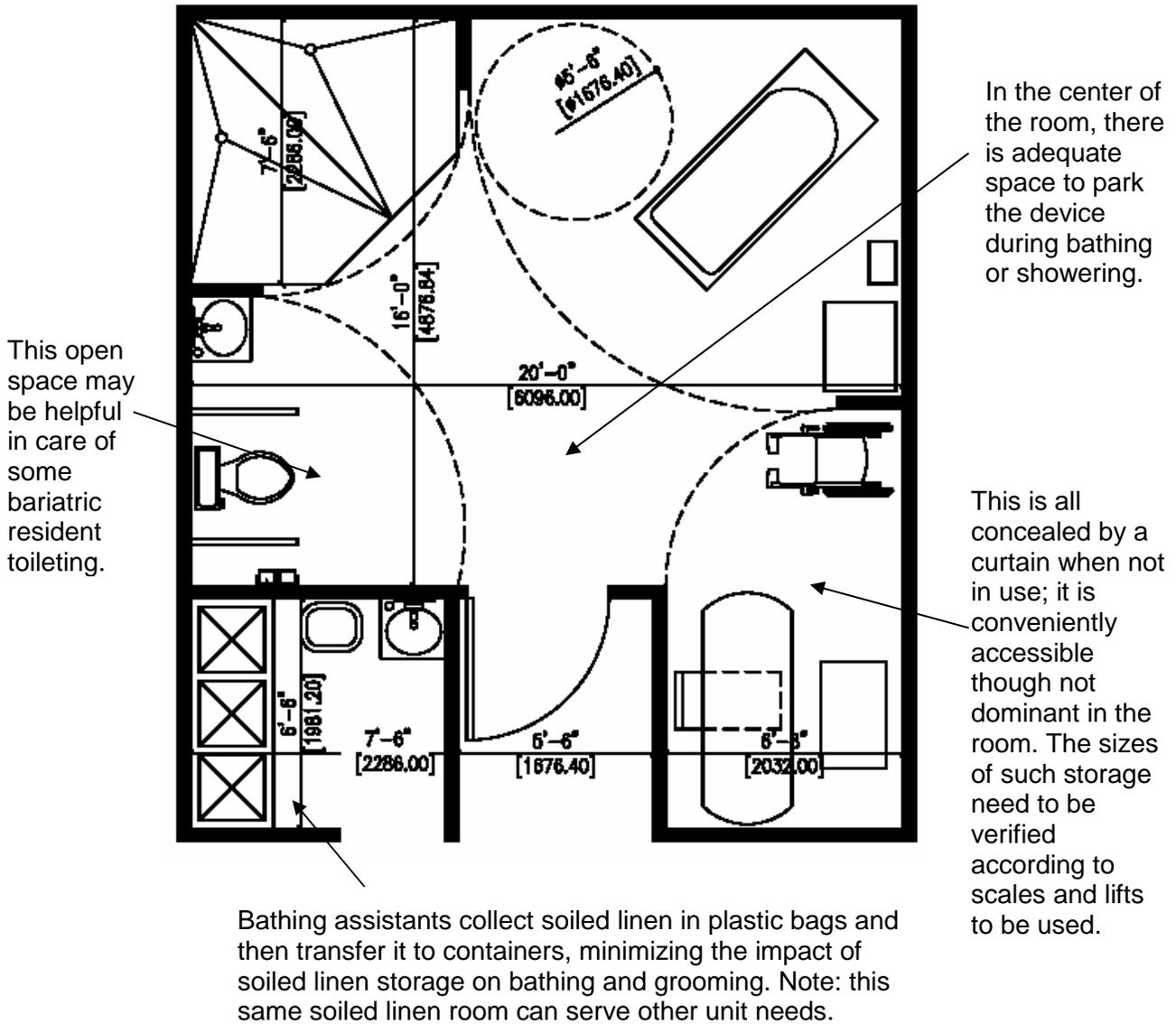


Figure 3.13

Bathing Suite with Shower, Tub and Sample Lift Clearances.

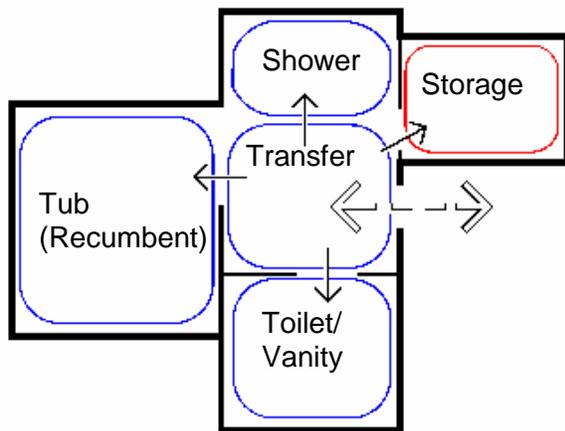


Figure 3.14

Open Plan Bathing Suite with Grooming

3.3.4 Interior Considerations

Options below help define bathing as a comfort for the individual, refocusing residents away from institutional model attributes:

1. Window and Visual
Consider the following:

- A window (screened for privacy) to allow natural light.
- Non-glare surfaces for floors and walls improve visual comfort and may reduce falls.
- Lighting levels for the general room should be 30 foot candles, 300 lumens and the skin care and grooming areas should be 60 foot candles, 600 lumens.
- Art and accent colors on curtains. Great effort has been made to allow fixtures to blend into the background so that the equipment itself does not dominate the space. Art should be selected for use in moist settings such as ceramic art.

2. Acoustics

Due to the prevalence of hard surfaces in bathing suites, there are few opportunities to improve the acoustics or apply noise-reducing materials. Textural variety may reduce some problems with background noise transmission or the commonly experienced “echo” problem. Tub selection criteria should include low noise levels. Other opportunities to reduce noise include window coverings, shower curtains, cubicle curtains and flooring.



Figure 3.15

Bathing Suite with Grooming and Storage.
Peabody Retirement Center, North Manchester, IN;

3. Texture

Lightly textured floor coverings may be added to improve footing. Vestibular stimulation, a bi-product of whirlpool, hydro sonic or other water jet action, may promote relaxation and provide pain relief.

4. Natural/Familiar

Plants and familiar objects, including grooming implements, contribute to the goals of a pleasant ambiance. Music featuring natural stimuli may be incorporated into the design.

3.3.5 Systems Considerations

N/A

3.3.6 Miscellaneous

1. Sample Performance Criteria for Tub Selection

Recumbent tubs may provide the most options, when only one model will be used in conjunction with a supine shower trolley and appropriately sized shower area. Recumbent tubs may have advantages for transfer, hydrotherapy and body core temperature. The basic assisted tub should:

- Have a door opening to avoid elevated lifting unless resident users are transported and bathed in supine position
- Have fast fill and drain modes
- Enable residents to either sit or recline in the unit.

Portable shower trolleys may be preferable to providing elongated tubs. Verify fill rates for elongated tubs and whether use of a shower trolley is more effective.

- As applicable, check on the pieces required for supine bathing and storage implications.
- Even though some shower trolleys partially fold, space must be provided for storage when other users will be in the bathing unit.

A handheld shower attachment may be useful for hair washing, rinsing the resident, and for cleaning the tub.

2. Method for Estimating Numbers of Bathing Suites

Residents have individualized care plans that identify the numbers of baths or showers per person per week. Expectations for baths appear to be increasing as a means of providing skin care.

- *Numbers of Baths*

The provision of in-room showers has not precluded the need for bathing suites for typical residents. Particular sub-populations, as identified in the program of care, may use bathing suite facilities less frequently warranting a different calculation.

- *Time*

The assumption that each bath and clean-up requires 30 minutes, and that baths are not taken during meal times, leaves a window of 8 hours per day over an interval of perhaps 12 hours. This computes to 16 slots of bathing time per suite per day. Applying this information and goals for the frequency of showering or bathing should help determine the number of bathing suites needed.

- *Ratio Proposed*

Plan bathing suites should be provided at a ratio of about 1:20 to 1:24 and fixtures at about 1:12 or portion thereof per resident.

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3.4 Resident Unit Design and Operations

3.4.1 General Considerations

Nursing Home layouts and facility appearances have been transformed by merging residents' needs with a better understanding of staff operations. It is the residents' needs that shape schedules and services. Design must correspond with how residents and staff circulate within the occupied areas, thus producing smaller group living experiences. Considerations include:

- Smaller resident neighborhoods
- Increased resident to staff contacts
- Nursing assistant(s)' need for support facilities
- Better gathering spaces
- Equipment space for staff

3.4.2 Planning Considerations

Jurisdictional and regulatory factors affecting unit size(s) are as follows:

1. *Minimums*

Staffing minimums are often stated as a ratio of licensed nurses and nursing assistants to the residents. Unit design should correspond to regulated minimums as well as the staffing levels that meet the needs of the residents.

2. *Plan Review*

Functionally appropriate design responses may require advance review with jurisdictional authorities. These include the following:

- Sight lines
- Plans illustrating staff functions on various shifts
- Communication systems
- Reference points for walking distances

- Charting facilities and implications of electronic systems
- Call lights
- Continuous handrails

3. *Operational Considerations*

Facilities are increasingly organizing residents in a series of smaller clusters and neighborhoods for care during the morning and afternoon and larger units for nursing coverage at night. Units of 36 to 48 persons also may function as sub-units (neighborhoods) of 18 and 24 respectively, based on daytime staffing ratios. For states mandating units of 60 beds, sub-units of 30 beds may be operationally more practical.

4. *Special Populations, Smaller Units*

When facilities identify services with very distinct populations and staffing requirements, they can elect to provide smaller units. This is accomplished by dividing a typical 30 to 48 person unit and operating a portion of that unit as specialized care.

5. *Staffing Patterns*

Staffing patterns based on resident needs may contribute to the design of units. In addition, the licensed nurses available for direct care at night should help establish the unit size as there are generally more licensed nurses available on days than on night.

6. *Combining and Linking Units*

The points at which resident units attach to one another provide ways for streamlining operations. (See Table 3.5) Examples are:

- *Unit-to-Unit* - Judicious placement of activity and therapy suites, meeting rooms, porches and similar "destinations" may provide

opportunities for designers to create attractive, shared, common facilities located at short distance from each unit. (See Figure 3.17)

- *Unit-to-Commons* - Well-placed unit connections streamline service traffic associated with meal service and materials.
- *Unit Organization Points to Distribute Staff* - The options are:
 - On or Between Units
 - Associated with a Particular Sub-Population
 - Central to Units
- *Efficient Connections* - Short connections or halls between units or services and commons should be designed to include secondary functions to avoid uninhibited stretches of halls and costly tunnels.

7. *Single-Story Considerations*

Veterans' facilities have made an unusual commitment in Nursing Home facility design to develop single-story projects. (See Figure 3.16) Reasons for favoring single story projects are:

- For Residents
 - Improved outside access and more possibilities for enjoying natural stimuli.
 - Greater sense of security in terms of evacuation.
 - Less reliance on elevators to ease maneuvering and increase attendance of off-unit programs.
- For Staff
 - Less time spent off-unit for accompanying residents to therapy, programs, and care appointments
 - More convenient access from units to amenities such as therapy and activities
- For Administration and Services
 - Use of a basement service level for linen collection at neighborhood intersections
 - Use of golf carts and exterior methods of circulation and delivery

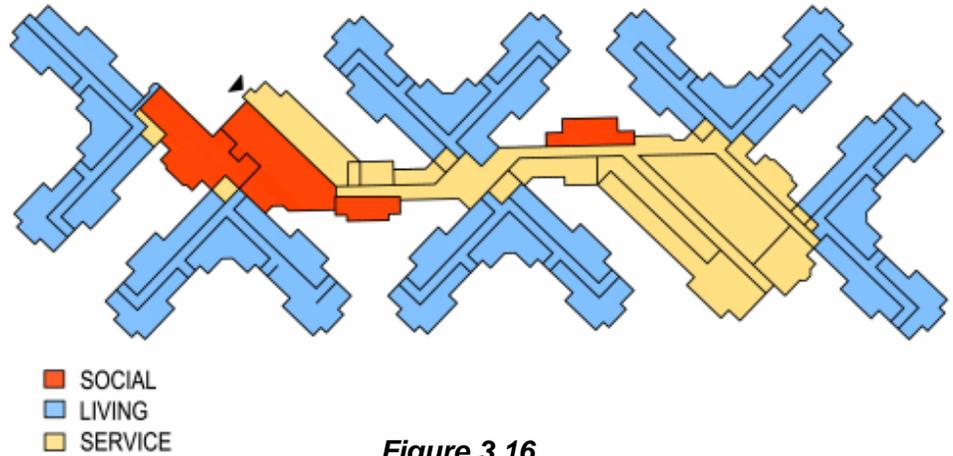


Figure 3.16

Functionally Connected Units in a One-Story Building
New York State Veterans Home Montrose, NY

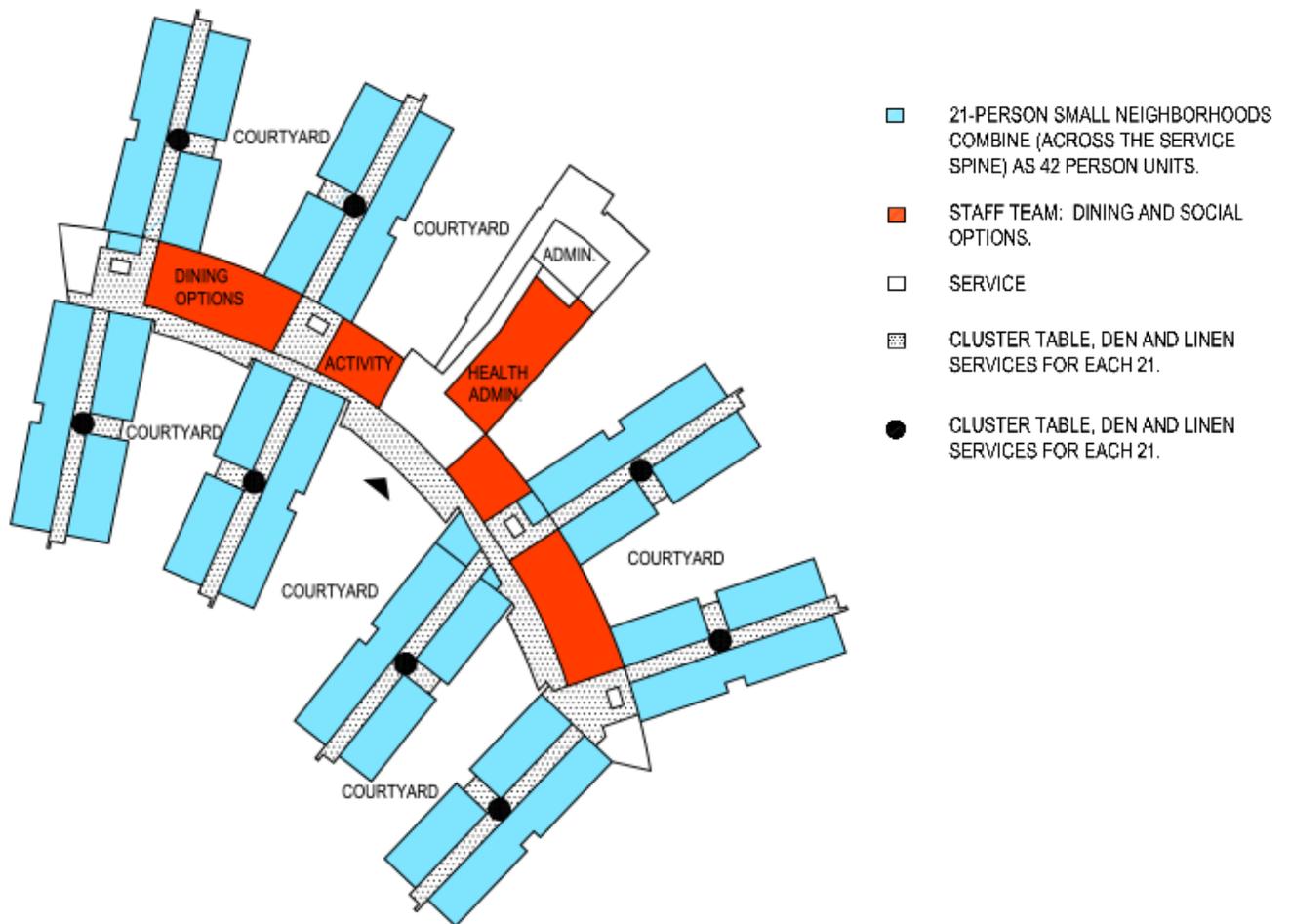


Figure 3.17

Combining Units into Buildings
Washington Veterans Home Retsil, WA

8. Multi-Story Facilities

Multi-story facilities are the result of site or program related factors. Two-story buildings allow units to share staff and common spaces. Multi-story projects can often obtain some of the same aesthetic advantages provided in the single-story facilities; for example:

- Distributing common spaces vertically as well as horizontally
- Designing verandas, porches and extensions of programs to the outside, with operable windows incorporated (See Figure 3.18)
- Designing higher ceilings and clerestories for common spaces on upper floors
- Creating destination features by orienting vistas toward particularly engaging views, which are visible only from upper floors



Figure 3.18

Multi-Story Facility Amenities

CO State Veterans' Home at Fitzsimons, Aurora, CO

3.4.3 Design Considerations

1. Visual and Auditory Monitoring

Staff should be able to continually observe areas where residents emerge from their bedrooms as well as monitor

unit exits and entries. This may be accomplished by designing so that:

- Staff routinely encounter residents
- Views are unobstructed from work desks to halls, dining, gathering areas and outside spaces
- At night, licensed staff have a view of desks used by nursing assistants
- Equipment and low voltage wireless systems are used to provide information about door positions, to monitor specific medical equipment, and sometimes to monitor the risky movements of identified wanderers
- Staff members are outfitted with wearable communication systems to provide continuous coverage as they circulate through a "neighborhood" or unit.

2. Walking Distances

Design the Nursing Home with short travel routes down corridors, through units, and between resident rooms and dining areas. The following are recommended travel distances:

- *For Older People.* Average travel distances of 50' to 60', with extremes of less than 80', can encourage resident ambulation and self-propulsion.
- *For Nursing Assistants.* Typical walking distances of 30-80' are preferable (and illustrated in this Design Guide) in comparison to building configurations with centralized staff assignments that can generate distances of 320' or more.
- *For Licensed Staff and Physicians.* Optimizing walking distances for licensed staff and physicians is important, as many are required to cover the extremes ("ends-to-ends")

of the unit. Distances may range from 80' to 340'.

- *Best Practices.* “Interlocking” room design is included. These create short cuts and reduce gross area.
- *Lessons Learned.* Several unit configurations have led to caution regarding the development of courtyard plans, race track units with rooms grouped around a center service core and two single-loaded corridors, and round units as these increase walking and complicate sight lines for night care.

3. Resident Rooms Adjacent to Social Areas

Residents should have a social destination directly available from their room(s). Spaces for social and other activities should be inviting and comfortable to encourage residents to get out of their rooms. (See Figure 3.19) These spaces should be nearby and be designed and furnished in a manner to provide way finding and comfort.



Figure 3.19

Social Spaces Adjacent to Resident Bedrooms

*The Highlights at Wyomissing, PA;
SFCS Architects, Roanoke, VA*

Staff should have work, storage and communication facilities located near their assigned resident rooms. Care is less fragmented and less “regimented”

when each staff member has the space and resources necessary to respond to residents’ needs and schedules. Residents should spend less time waiting for assistance to get to social areas.

- Decentralized support facilities for nursing assistants simplify relationships and increase their time with each resident. By clustering residents, the flow in a typical day, including movement to and from dining and activities, can be streamlined.

4. Flexible Communications

Clustering should respond to the efforts of nursing assistants and nurses to overcome limitations of fixed, central call systems and utility hubs, to minimize steps back and forth to manage the systems. Flexible communication systems are critical to the success of decentralization and they require linking unit hardware through appropriate software design.

5. Nursing Assistants’ Clusters

Support facilities clustered around one nursing assistant may include the following:

- Facilities for clean linen, soiled linen and supplies
- Work space
- Repeater center for call system
- Computerized chart with controlled access

6. Neighborhoods

The following may be provided for residents and shared by two or three nursing assistants:

- Great room, den or social area

- Kitchen area for snacks and socialization
- Bathing suite
- Porch or outside access

7. Staff Stations, Team Centers and Cluster Desks

Three commonly designed unit work spaces for nursing staff that respond to a facility's operations, staffing, and care, are staff stations, team centers and dynamic cluster desks.

- **Staff Stations** - The staff station is an identifiable hub and may work in conjunction with a team room and cluster desks. The traditional nursing station has become a cluster desk with access to security panels as well as location that can be used for night staff. In most jurisdictions, smaller stations for management of nursing and related care are viable. Smaller desks may seat 1-2 people and other staff members may be located along a corridor and in the team room. (See Figure 3.20). When meetings and care planning are done in the team room, it is preferable that participating staff be visible and monitor unit security features.



Figure 3.20

Small Station, Team Work Area Nearby
Nevada Veterans' Home
Boulder City, NV

Some accommodation should be made to manage the resident call system when the desk is not staffed. This may include use of wireless technology that has been programmed to reroute resident call signals. Low profile desks help residents in wheelchairs approach staff. The design should prevent access to private information and computer cables.

In some settings, a completely decentralized approach to staffing may work best. For some Nursing Homes, this may include replacing the traditional staff station with a "living room" where charts are kept in cabinets with charting done in the resident bedroom via a hand held device or in alcoves outside or inside the resident bedroom.

- **Team Centers** - Team center design should address the following (See Figure 3.21):
 - An alternative to conducting administrative transactions and meetings in an open-plan staff station
 - Equipment and related items necessary for center function (see Guide Plate #7)
 - Required staff for two adjacent neighborhoods of one unit for care planning
 - Part-time use

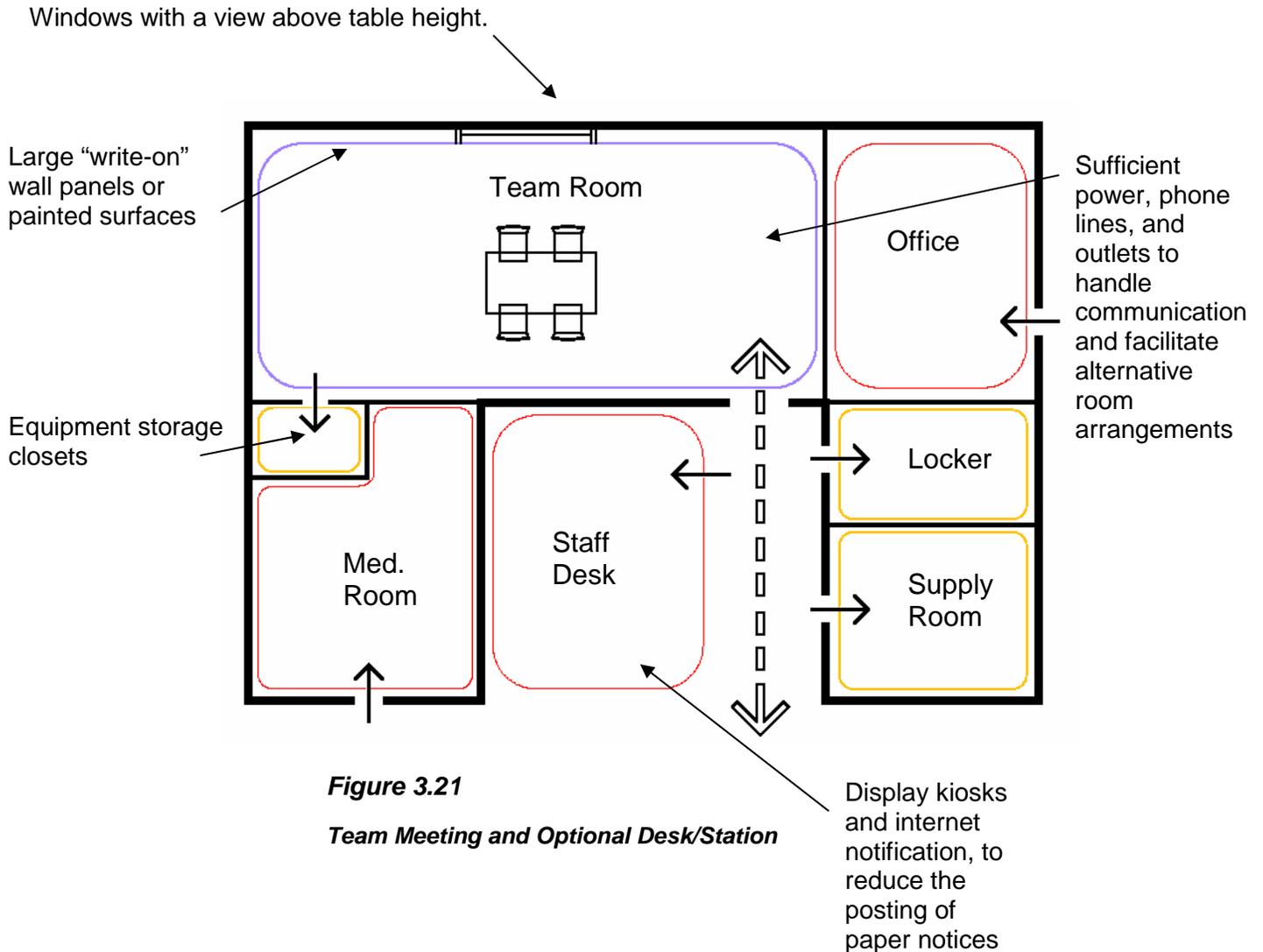


Figure 3.21
Team Meeting and Optional Desk/Station

- *Dynamic Cluster Desks* - Appropriately equipped, decentralized work desks respond to the assigned positions of nursing assistants and the needs of the nursing staff. (See Figure 3.22) Dynamic cluster desks are not stations that are staffed continually but are used as needed with personal information protected from unauthorized access and view. These desks may be located near 1-2 nursing assistants'

clusters of rooms and used by them, licensed staff, and medical professionals making room-to-room rounds. (See Figure 3.24) These workstations are dynamic because an array of equipment allows protected access to records, transmission of orders, and coordination of documentation. Storage should be customized to each cluster's or unit's focus. (See Figure 3.23).



Figure 3.22

Dynamic Cluster Desk

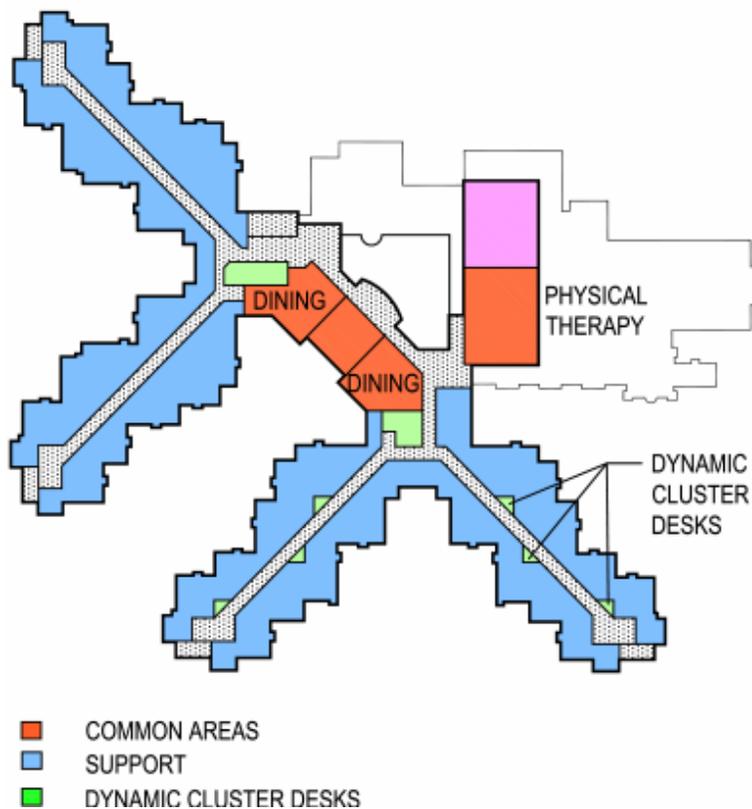
*NY State Veterans' Home at Montrose, NY
Perkins Eastman Architects*



Figure 3.23

Cluster Desk Integrated into a Library Alcove.

*Shalom Park, Denver, CO;
KKE Minneapolis, MN with Boulder Associates, Boulder, CO*



COMMON AREAS

- Dining Room
- Family Dining
- Activity
- Bathing Suite
- Resident Phone
- Toilet
- Outdoor Gardens

SUPPORT AREAS

- Team Center
- Exam
- Medication
- Social Work
- Toilet
- Cart Niche
- Personal Laundry
- Clean Linen
- Clean Supply
- Soiled Linen
- Janitorial
- Storage (O2)

Figure 3.24

Collaborative Care: Nursing Assistants, Nurses and Dining Staff
Adapted from State Veterans' Nursing Home at Fitzsimons, Aurora, CO

8. Offices on Units

Staff preferences differ with regard to whether licensed staff and others require on-unit offices and/or access to private consulting rooms. Assigned office space is contingent upon the unit size and function. Increasingly, when nursing administration is located elsewhere, one office or room is made available for counseling, clergy, or as a quiet work room for physicians or consultants. (See Figure 3.25) Units that focus design on open staff stations, open team centers, and cluster alcoves are likely to benefit from at least one closed area, assigned, shared, or used as needed.



Figure 3.25

*All Purpose Staff Work Room/Library
Jewish Home of San Francisco*

3.4.4 Interior Considerations

1. Natural Light and Casual Gatherings

Natural light and casual gathering space may facilitate staff care. Methods of introducing natural light include clerestories, well-places, windows and a “J” style arrangement of rooms. (See Figure 3.26).

In some pod designs, the center gathering space is almost entirely interior space, lacking daylight or views.

When clusters are only service oriented, natural light and living amenities are compromised, and the advantages of small groups of residents go unfulfilled. When clusters are only architectural forms or places for social gathering, they may add to circulation space, while increasing both construction and staffing costs without necessary health support. Refer to Section 2.3 Perception and Interiors for more information regarding interiors.



Figure 3.26

End Windows and Clerestory or Skylight

Garden House II Alzheimer's Care, Weinberg Campus, Buffalo, NY

3.4.5 Systems Considerations

The first requirement of communication systems on a unit is that they help staff respond to residents and staff requests for assistance. The second important requirement is that they monitor fire alarm systems, exits and systems for other devices such as wandering, falls and oxygen.

1. Performance Requirements for Communications and Low Voltage Systems

The following are issues to address in systems planning:

- Wearable communication devices that will allow staff members to communicate from multiple locations rather than returning to a single location to manage calls.
- No one communication device currently exists to adequately supply the needs of the Nursing Home staff.
- Since duty distribution may vary from unit to unit in the same facility communication systems must be highly adaptable so staff themselves can adjust the equipment to the staffing pattern required. The system should accommodate staffing pattern changes.
- Intent is to keep extraneous noise at a minimum.

- Location of base stations by shifts and/or by unit.
- The need for a programming and a low voltage system consultant service.

A functional program description regarding the ways in the reliance on TV monitoring for remote management requirements should be addressed.

3.4.6 Miscellaneous

There are certain staff operational issues to consider when planning a Nursing Home facility. Table 3.5 provides three key examples of how facility planning can directly impact the effective operation of a nursing unit.

The three key examples are:

- Connections to other units and common facilities
- Horizontal connections and service routes
- Vertical circulation distributed among pairs of units.

See Table 3.5 for more information.

	Source of Potential Labor Trap or Savings	Description of Objective	Description of Problem(s)	Goal Examples
1	Connections to other units and common facilities	<p>a. To attach units to commons at a staff intersection or hub, and</p> <p>b. To attach so that staff and deliveries do not pass rooms prior to reaching service destination.</p>	Privacy is compromised when visitors or service staff encounter resident rooms, rather than common space with staff work area.	<p>a. Food is delivered to unit or neighborhood without passing rooms;</p> <p>b. Soiled linen is removed without passing rooms in another neighborhood;</p> <p>c. Visitors arrive at information and/or control point.</p>
2	Horizontal connections and service routes	<p>a. To minimize service routes from central areas to each unit;</p> <p>b. To maximize the useful destinations along central circulation.</p>	The collection system of soiled linen and waste, across units, needs to be developed to address efficiencies for both nursing and environmental services. This may require elevators, chutes, separate service routes and/or external access with motorized carts rather than "pushing" heavy carts.	<p>a. Attach units by the facilities they share;</p> <p>b. Eliminate long connector corridors or distribute commons along connectors;</p> <p>c. Provide the option for an external service drive or an underground route;</p> <p>d. Limit the walking distance to clean or soiled utilities to a maximum of 80'.</p>
3	Vertical circulation distributed among pairs of units	<p>a. Provide efficient nurse-to-nurse communication between pairs of units;</p> <p>b. Link nurses and nursing assistants for back-up;</p> <p>c. Improve access by clinical staff.</p>	<p>a. Unsupervised, invisible exits;</p> <p>b. Corridors with no view of staff;</p> <p>c. C.N.A.s cannot find nurses.</p>	Locate vertical transportation so it does not interfere with the efficient communication and sharing of functions (i.e. break, conference or dining rooms) among units.

Table 3.5
Operations' Considerations in Combining Units into a Building

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3.5 Alzheimer's Care and Dementia Support

3.5.1 General

It is estimated that people with diminished memory are the predominant resident population of Nursing Homes, accounting for 50-75% of the residents present on a typical day. Estimates include the following:

- 44% are identified with dementia and 28% are described as depressed;
- 54% of US Nursing Home residents are part of behavior management programs; and
- 7-15% wander.

Alzheimer's Association estimates that the prevalence of the disease is expected to increase along with the increase in people over 85 years, from about 4.5 million in 2000 to 5.5 million in 2020 and perhaps 9 million in 2040.

Nursing Homes increasingly offer specific programs and facilities for two sub-populations of their cognitively impaired residents:

- Those who suffer from diminished memory and flawed judgment but are active and fairly physically adept.
- Those who are profoundly physically and mentally impaired.

There is no one accepted practice for meeting these population needs. As sponsors have gained experience in improvising care and services for these individuals, they have increasingly relied on the environment as a critical resource for their dementia care services.

3.5.2 Planning Considerations

1. Residents and Alzheimer's Care

The Nursing Home should be ready to respond to residents experiencing any and all of the following:

- Flawed judgment affecting personal safety
- Agitation
- Insufficient attention span for eating and drinking fluids, dressing, and exercising
- Difficulties processing information and/or recalling immediate events or sequences
- Difficulty in multi-tasking
- Greater risk of falls
- Wandering, pacing, and rummaging
- Inability to make needs known
- Difficulties translating from symbols to actions
- Confusion in larger groups and unfamiliar surroundings.

2. Other Related Sub-Populations Served

In addition to adult onset cognitive decline, veterans care may include dedicated programs and provision of small units for people with other defined behavioral challenges such as:

- Post-traumatic stress syndrome;
- Severe clinical depression;
- History of substance use;
- Chemical exposures and dependencies; and
- Recommendations for small group units respond to basic unit layout, operations, and applicable safety and security.

3. Staff and Alzheimer's Care

Alzheimer's disease and related conditions progressively transform

individual residents. Unpredictable behaviors that can impact the unit staff are:

- Demands on staff are greater in terms of oversight of both the people and the environment.
- Staff strives to refocus stimuli and behavior toward foci that provide comfort and reduce anxieties.

4. *Designated and Distinct Units for Memory Support*

When designing distinct accommodations for those with Alzheimer's and related disorders, consider the following:

- Provision of smaller units with specially trained staff
- Secure areas for those who wander
- Provision of engaging, individualized programs.

3.5.3 Design Considerations

This section provides guidelines for achieving a safer, more responsive design.

1. *Safety and Security*

The design of areas for people with limited judgment should incorporate a combination of the following measures:

- *Location in the Building* - Provide active residents with ground-level dwellings that provide, on the same floor, dining areas and secure access to the outside.
- *Perimeter* - Provide perimeter control, door identification, an approved system for exit control, and door alarms and release. As appropriate, consider time release and/or magnetic locks, key pads, and specially designed hardware

that locks or unlocks doors selectively upon the approach of identified individuals.

- *Boundaries Directly Outside Unit Exits* - Methods for providing outside unit boundaries defining secure gardens are to include perimeter fencing of minimum 7' height, motion detection and sensors, concealed entries, and off-set fences.
- *Exits* - Investigate the integration of communication from exits, call systems, and motion detectors to radios and/or wireless systems by working with communication consultants or professionals.
- *Controlled Access* - Control access to areas not specifically designed for use by residents and those spaces that require cognitive judgment such as stoves, soiled linen, running water, and office equipment.
- *Monitors* - Consider including fall and bed monitors, security cameras and sound monitoring equipment.
- *Windows* - Window openings should be controlled to minimize risky elopements, yet operable to allow for fresh air.
- *Floor Safety* - Design should eliminate the need for ramps, as floor levels should be continuous. Consider institutional-grade floor surfaces that appear like carpet but clean with one process to minimize potential problems associated with wet floors and time associated with floor finishing.
- *Personal Possessions* - Make accommodation for storage, appropriate access, and protection of personal possessions.

2. *Reduced Agitation*

To reduce environmentally induced agitation, mitigate potential sources of

background noise including traffic, HVAC systems, ice machines, and overhead paging systems. Reduce unnecessary travel through a unit as feasible.

3.5.4 Interior Considerations

1. Room Recognition

Visual, auditory and tactile cues are used in dementia care to encourage stimulation, for example:

- Fresh aromas to signal dining and stimulate digestion
- Interior design techniques to camouflage features of the environment that are not essential to the resident. (See Figure 3.27) Consider using the same tone for walls and doors of utility areas and placing utility room signs above eye level.



Figure 3.27

Monitored Exit Door with Art.
Epworth Villa, Oklahoma City, OK
ADG, Inc., Oklahoma City, OK.

- Personal items to identify a door, such as memory boxes

- Distinctive, illuminated destinations in view upon leaving one's room
- Non-glare lighting at levels appropriate to general and task lighting (see IESNA, 1999)

2. Personal Possessions

Reinforce individuality by using safe display methods including storage units and protection of small items in appropriate display units. While fabric art, including vertically hung quilts, can contribute to individuality, they need to meet applicable flammability requirements.

3. Engaging Activity

Dementia care programs manage symptoms by providing simple stimuli and familiar objects, inviting touch, and offering options for appropriately dissipating emotions such as digging, sports, walking, or actively rocking. Residents with fragmented memory benefit from exercise and the perception of freedom. The specific routines of daily life, emphasis on natural stimuli and home style dining will vary from facility to facility. Develop specific ways of working with both active people and those exhibiting more profound needs.

4. Blended Dementia Populations and Small Nursing Care Units

It is possible to design a program and unit that serves both active and more sedentary individuals with Alzheimer's and similar needs. Consider sharing some service facilities and staff members with more traditional Nursing Home care. On such units, assigned staff:

- Facilitate more continuous group programs

- Engage those who can function in groups, with varying levels of participation or attentiveness
- Monitor, simultaneously, the more active residents who may freely move about, explore and engage
- Provide small group dining
- Have ready access to small, secure outside space.

5. *Active Residents and Small, Dedicated Alzheimer's Care Units*

Small, distinct, and home-like units are one option for meeting the needs of cognitively impaired residents who are mobile and energetic and/or restless or particularly disoriented. Consider the following:

- Small groups limit the impact of the physical environment and the unpredictable behaviors of residents on each other.
- In these smaller settings, staff may be diversified in their duties. This can simplify food service and provide a more relaxed environment. This is necessary for responding to wandering residents, while simultaneously caring for those who are occupied.
- Connect several small units so that pantries, licensed nursing staff, and environmental services may be shared.
- Consider small units with home-like ambiance for those residents who receive licensed nursing care due to severe clinical depression, behavioral management, or psychosocial needs.
- Small units can be used for in-patient hospice care during more acute stages of symptom management,

supplementing palliative and end-of-life care offered through home care or in other settings.

6. *Program Rooms*

Residents' needs can be supplemented for memory support programs with in-house day care or specially outfitted program rooms. Program rooms are generally a secured area at about 36 nsf [3.34 m²] per person, including the room, bathroom(s), wander garden, staff work space, storage, and collateral materials that residents can touch, use and explore. Figure 3.28 illustrates a series of individual and group activity options.

7. *Sensory Stimuli Technology*

For profoundly mentally impaired individuals, Nursing Homes use large items to engage the person through his/her basic senses of vision, audition, touch and vibration. Figure 3.29 illustrates stimuli that can be incorporated into program space, casual gathering areas, or even adapted for use in small alcoves virtually surrounding an individual.

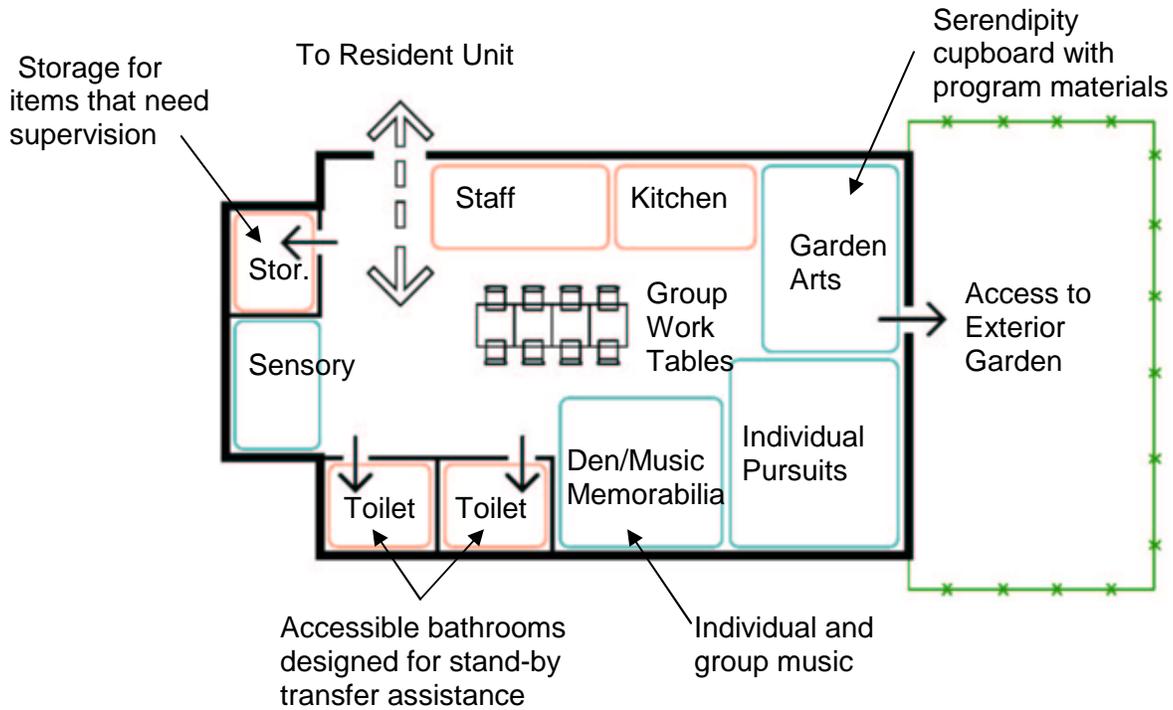


Figure 3.28

Memory Support in a Program Room

		<p>Left: Abacus: Table models: 10-18" x 10-18"; also standing floor/wall models of 10" deep, 3' long and 3-4' high.</p>
		<p>Right: 'Ups and Downs' similar to above: table models and floor models.</p>
		<p>Left: Stacking cups, figures. May be strung until used or placed on spoon or other shelves; available (18" square).</p>
		<p>Right: Reeds, flowers, cattails; fresh or dry, as individual pieces inside; gardens outside; floor planters or jardinières. Part of art. Sizes vary.</p>
		<p>Left: Soft books; Pop-up Cards. Flat on shelves, placed on tables. 1' linear space.</p>
		<p>Right: Relief surfaces for tracing used on flat tables with pressure sensitive paper/cloth. Leaf, buckle, coin, gelatin mold. 2' linear space. Grouped and wall hung; in trophy cases or shelves.</p>

Figure 3.29

Examples and Dimensions for Sensory Stimulation Equipment

Initial stimuli are generally selected for their familiar appearance, bold features, movement, or potential to produce curiosity, relaxation or simple non-verbal responses. Military service and veterans groups may be helpful in identifying and obtaining specific items, which may range in size from a ship's wheel or car to smaller items. Carts and room feature kits are available for purchase to supplement donated items.

8. Active Residents: Medium-Sized Units

The more home-like the facility is made, the better the resident will respond to the environment.

By combining the options of active program rooms and distinct units, facilities may limit the confusion of some residents in medium-sized units by incorporating features to:

- Accommodate individual activity
- Serve simultaneous small groups
- Provide continuous monitoring of the space
- Privately work with individuals
- Manage noise
- Minimize service traffic



3.6 Activity and Social Spaces

3.6.1 General

Design Veterans' Nursing Homes to include a variety of social opportunities, both on- and off-unit, which can be customized according to mental and physical needs.

3.6.2 Planning Considerations

1. Resident Participation

Nearly all residents engage in some social interaction, leisure pursuits, sensory stimuli, and/or music-related programs. The typical resident may have 10 to 13 hours per day available for personal and casual activities. For most residents, less than 10% of this time (or 1 to 3 hours per day) is spent in organized, professionally led programs.

Special events may draw about 50% of a Nursing Home population about 1 to 4 times a month for the more frail residents, more often for the more adept. Volunteers and veterans' groups contribute to strong social calendars in most veterans' Nursing Homes.

Typically, 60-75% of the participants are likely to use wheelchairs during their social activities.

2. Staff Time

For each 45-60 individuals, the typical Nursing Home employs about one person for its recreation staff; nursing assistants and others fill in as time is available. Typical groups for daily activities number 6-20 people. Recreation staff usually meets groups

of impaired residents rather than individually take residents to central areas for routine, daily activities. On-unit social spaces should be designed for group work areas instead of dining accommodations. Staff members should not be required to rearrange heavy furniture or remove unused chairs before holding such activities. Nursing staff should be able to conveniently monitor residents in on-unit social spaces.

3. Translating Volumes of Users into Space Sizes

To arrive at sizes appropriate to accommodate the residents including their devices, the equipment used and fixed room features for five common social amenities. Refer to Table 3.6 at the end of this section.

4. Focal Points

Assembling people in wheelchairs or recliners around a staff station and/or in the halls is not acceptable for casual gatherings. Residents' focus should be toward meaningful life references, such as art and nature rather than medical records, staff stations or staff communications.

5. Jurisdictional Requirements

Space requirements vary for social, activity, and visiting space such as recreation, quiet and family spaces. Develop a functional program to address activities, casual seating, destinations and specialized facilities, such as those for people with Alzheimer's disease or other related disorders.

3.6.3 Design Considerations

Design activity spaces and social areas to respond to the different residents' abilities and needs. Refer to Table 3.7 at

the end of this section.

Provide three types of spaces: on-unit casual gathering, designated activity, and multi-purpose social hall/assembly areas. These may be organized into destinations, such as Main Streets, that imitate local venues.

1. Guidelines for Designing Accessible Rooms with Tables

Appropriate space for access into and throughout social spaces furnished with tables increases comfort and ease of use. Figure 3.30 illustrates a method of establishing trade-offs between table size, table arrangements, clearances for circulation, cart deliveries, and resulting room sizes.

As shown in Figure 3.30, the 48”[1219 mm] square tables, arranged at diagonals, provide circulation of 48” [1219 mm], including turning space without conflicting with other occupants, while conserving on overall square footage needed. Larger and round tables will increase the area required. Smaller tables may result in conflict due to the allowances required underneath the table for wheelchairs, foot pedals, and table bases or legs. Use of these same sized tables, placed on a parallel grid results in a larger space in order to meet aisle widths. Some variation in table size, i.e., use of two-person and six person tables, is encouraged. These criteria have led to the recommendation of 36 nsf [3.34 m²] per resident occupant in dining and social areas planned for resident use at tables. (See Figure 3.31.)

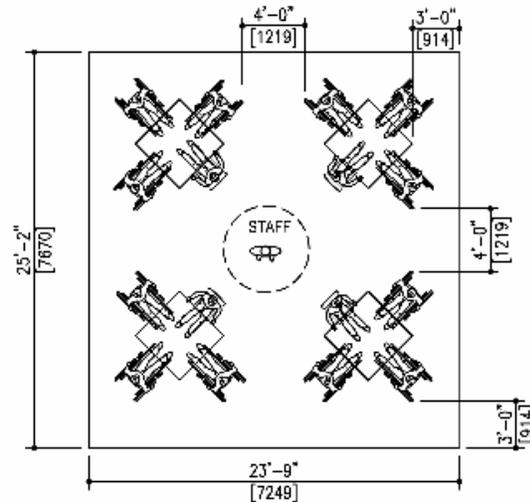


Figure 3.30
Table Size, Space Needed and Arrangement Study



Figure 3.31
Resident Dining and Social Area
New York State Veterans Home
Montrose, NY

2. Organizing Individual Destinations: A Main Street

Off unit-program spaces may be organized and presented so that small individual spaces are grouped. These may include barbershop, mailroom, meeting room, private dining, card/playing, porch or garden(s), patriotic features and military memorabilia, outdoor views, volunteer centers and

shops. These areas become an experience or destination, even when not using a specific space.

3. On-Unit Casual Gathering

On-unit gathering spaces are provided, at a ratio of one per each 12-24 persons. On-unit, casual spaces include features such as windows with views, tables, gardens, country kitchens, exercise space or equipment, music listening and participation. (See Figure 3.32) Such spaces are used for residents with comprehensive impairments as an alternative to lining residents up in corridors. Accommodate areas for resident supervision such as staff work areas located in close proximity to casual gathering areas. Functions for on-unit areas include:

- Reading
- Conversing and storytelling
- Serving snacks
- Viewing outdoors
- Celebrations
- Family visiting;
- Selective media use



Figure 3.32

Casual On-unit Gathering Space
CO State Veterans Home at Fitzsimons, CO

4. Destinations and Designated Activity Spaces

Included are a chapel, hair or personal care area, canteen, computer library, and controlled outside access areas. Consider including an activity room, a dementia care program room and fitness facilities.

5. Multi-Purpose Social Halls

Plan multi-purpose rooms for 40-60% of the residents. Higher capacity may be needed to accommodate peak participation, such as holiday events with invited visitors, which may experience participation of 80%. Other criteria include the following:

- Ease of entry access - multiple or double doors; adequate space for seating; a central location; good sight lines to a stage, screen or other focal point; and effective acoustics.
- Seating plans and focal points should address participation for wheelchair and non-wheelchair occupants.
- Include adequate and convenient table and chair storage.
- Provide a uniformly level floor, consistent with the proportion of wheelchair users.

6. Examples of Activity/Social Areas

Activity rooms accommodate baking, table arts and wet and dry crafts, holiday projects, games, cards, project displays, and pets. For pottery work, firing should be done in a space that appropriately protects residents and staff from the heat and hot surfaces.

- *Kitchenettes* - These may satisfy nourishment requirements for nursing care and also may be part of an activity program with separate, secure storage. A kitchenette with a table

encourages private dining, birthday celebrations, small group occupational therapy, special bariatric dietary programs, and family-staff meetings.

- **TV/Media Center** - The television should not dominate the visual and acoustical environment of all social areas. A TV and media center may be in a room that serves as a point for cross-facility contact with other veterans' groups, facilities for low-vision viewers and hearing impaired listeners, or a distance education center.
- **Gaming Areas** - Gaming areas should provide equipment and space for playing, watching, and celebrating gaming and sports. Gaming areas encourage additional participation from spectators. (See Figure 3.33) Plan multi-functionally gaming areas such as a club, party room, or a destination for younger or energetic residents for evening use.



Figure 3.33

Games Open to Passers-By

NY State Veterans Home, Montrose, NY;

- **Fitness, Exercise and Stretching** - Emphasize lifelong wellness programs and provide senior-friendly equipment in dedicated

fitness centers. Consider location with restorative therapy services. (See Figure 3.34)



Figure 3.34

Fitness Adapted for Nursing Homes

Virginia Mennonite Health Center, Harrisonburgh, VA

7. Barbershop/Beauty Salon

The traditional barber or beauty shop is a special destination, often located along a Main Street. (See Figure 3.35)

Grooming shops average 120 min to 400 nsf max [11.15 m² to 37.16 m²] and are planned for:

- Adjustable height sinks that facilitate care of those in wheelchairs and minimize uncomfortable positioning;
- Stations average 60 nsf [5.57 m²]. Stations are equipped with a telephone, a manicure cart and grooming equipment, and locked storage for chemicals.



Figures 3.35

Barber and Beauty
Eastern Veterans Home,
Boulder City, NV.

8. Canteens

A canteen is a drop-in gathering space, store, area for eating, and destination during visits. Locate space adjacent to another social space or dining area. (See Figure 3.36).



Figure 3.36

Canteen
Photo furnished by Nevada Veterans' Nursing Home, Boulder City, NV.

9. Pets On-Unit

Animals are frequent visitors in health care facilities and Nursing Homes.

Short or long term stays by pets are encouraged. State health department regulations may require a series of safeguards and even training for pets-in-residence. Typical requirements for facility pets include:

- A distinct eating/sleeping place that is not in a dining room for residents or staff, and separately stored pet supplies.
- Birds need to be kept in aviaries. Tabletop cages average 20 nsf [1.86 m²] and sanctuaries are 60 nsf [5.57 m²] or larger.
- Animals, if welcomed, may also use "dog houses" and/or pet visiting areas, including facilities for dog curbing, to minimize staff clean-up and soiled resident-use areas.

10. Smoking Room

Smoking behavior has been and continues to be controversial in Nursing Homes. Consider accommodating smoking, with a policy of one supervised person at a time. Ensure that smoke does not negatively affect residents or staff when windows to a smoking room are opened. If outside smoking is permitted, provide designated areas sufficiently far from dwelling areas and offices to limit second hand smoke transmission.

11. Meditation and/or Multi-Faith Chapel

Provide an inside chapel for meditation/contemplation or small ceremonies. Supply moveable, rather than fixed, chairs to accommodate people of varying mobility needs. Accommodate small formal services and ceremonies as well as impromptu visits throughout the day. Offer a dedicated area of 140 min to 450 max nsf [13.01 m² to 41.81 m²] according to facility size,

with capacity to open onto multi-function rooms for additional seating. (See Figure 3.37).



Figure 3.37

Chapel with Flexibility.

MO State Veterans Home, Warrensburg, MO.

3.6.4 Interior Considerations

N/A

3.6.5 Systems Consideration

N/A

3.6.6 Miscellaneous

Refer to the following tables to assist in the planning of activity spaces in a VA Nursing Home facility.

Estimating User Counts and Space Sizes for Activities.

Items To Consider	Individual, Casual Area(s)	Casual Seating Near Staff	Small Group	Meetings: Typical Groups	Assembly
<i>Estimates Based on Total Nursing Population, Typical</i>					
Number of participants	1 to 3 1-2 per unit	3 to 5 1-3 per unit	6 to 9 0-1 per unit at specific times	10 to 24 Scheduled: one for 1 or between 2 units.	30-70% of residents depending on assistance. 1-4 times a month
Examples	Observing, talking, looking at media, fish, birds, activity	Visiting, observing fish, birds, music listening	Family visit, discussion, support group, sensory function	Recreation, baking, gardening, animal visits	Music, performance, movies, exercise, also: formal religious, holiday, fairs
Basis for size per person gathered. (In net square feet (nsf) per resident)	28-32 nsf [2.60-2.97 m ²] for alcove, no table. 36 nsf [3.34 m ²] for seating at tables or for oversized seating alone	28-36 nsf [2.60-3.34 m ²]. Add space for fish tank, birds, other focal point, window	32-36 [2.97-3.34 m ²] Assume tables for 2-4 or 6. Add space for focal point, media	28 nsf [2.60 m ²] for meetings, no tables. 32-36 nsf [2.97-3.34 m ²] for groups, meetings at tables. Add Storage	Wheelchair and straight chair seating at average of 25 nsf/person [2.32 m ²]/person x Estimated (30-70%) + stage. Area for military displays, AV.

Table 3.6

Common Locations for Offering Specific Activities

Themes and	Casual Space On-unit	If in a Specially Designated Room	Multi-Function Central	Other Ways of Accommodation
Music	Listening area	Performance, practice	Participate, join	Before dining: Listen, Join
Exercise, Movement, Stretching	Chair exercise with leader, music, light-weight ball toss	Fitness area, game space, billards, adapted ball	Chair exercise, ball toss, net target, fitness, dance	Halls, outside physical therapy
Casual Social	Discussions, reading, seasonal events with food	Canteen or country store, "Main Street", library/newspaper	Parties, holiday theme "socials"	On any hall with "peddler's cart," staff offices, pre-function dining
Memory and Mental Support: High Function refers to those with good memory who seek mental stimulation	High function: Internet, tech use, drive simulator, collections, puzzles Alzheimer's: Theme circle, catalog reading, object focus, cues, Montessori, lotto - matching, walk inside, energy outlet, current events	High function: Library, computer Alzheimer's (Active): Program in-house, Day program, Montessori, baking, secure garden Alzheimer's (Heavy Care): "program room"/highly, sensory, natural	Speakers, comedians, animal visits, travelogues, vintage movies, events involving traditional costume, food, music and equipment.	1 to 1 visits, more small groups of 6-12, contact with family (phone, mail, internet). Use of "touchable or usable" environmental features (art, smell garden, collections for sharing)
Arts, Manual Dexterity	Arts, crafts	Rubbings, dough, adapted art	Making items for use in sports	Work with color, natural arts, herbs
Spiritual	Devotionals, ceremonies	Chapel, meditation, garden, or room	Faith services, music, liturgy	In room visits, pastoral office
Discovery – "Found Activity"	See "great room", use of landmarks, "memory lane"	Walk/wheel to Main Street, porch, canteen, garden, activity rooms, games, TV, media centers, barber/ beauty, pets	Children's programs, fairs and carnivals, preparations for these can also be fun to watch or help set-up.	Volunteer visits, children visits, bringing, pets and animals to the unit or room.
Outings	Trips, all types: sports restaurant, play	Controlled trips: van outings to secure places	Wheel outside, winter garden. drive, porch	Varies by locations, season, need safe area for bus use.
Personal Pursuits	Focus on movement: fish, action outside	High function: many, varied. Alzheimer's: 5-15% wander, rummage, pacing	High function: volunteer, visit, collect/decorate, news	High Function: TV, family contact, organizing personal possessions

Table 3.7

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3.7 Rehabilitation Therapy and Clinic

3.7.1 General

Therapeutic and clinical areas are essential components to a Nursing Home facility. Clinical areas treat the immediate needs of the resident from medical to psychological. The functions provided in therapy areas bring a sense of usefulness and personal pride to the residents. The rehabilitation therapy types discussed in this guide are physical, occupational, speech and hydrotherapy.

3.7.2 Planning Considerations

1. Physical Therapy

Physical therapy programs include twelve or more common types of equipment and five or more treatment “modalities” such as packs, stimulation and extremity treatment tanks. A physical therapist generally works with 1-3 residents at a time that requires a varying combination of equipment or treatment modalities. (See Figure 3.38)



Figure 3.38

Physical Therapy Room

*Nevada Veterans' Nursing Home
Boulder City, NV.*

In addition to physical therapy, kinesiotherapy may be employed to provide restorative care for residents no longer candidates for rehabilitation. Kinesiotherapists focus on utilizing exercise physiology for maintenance of function.

2. Occupational Therapy

Occupational therapy includes an adaptive kitchen, access to a training toilet, table(s) for small groups, and a wide variety of stimulating equipment and tabletop devices. (See Figure 3.39) Occupational therapy includes the use of a standing box and computer stations and access to a mat table. Therapists also require facilities for splinting or making supports.



Figure 3.39

Occupational Therapy

CO State Veterans Home, Fitzsimons, Aurora, CO; Boulder Associates, Boulder, CO

3. Speech Therapy

Speech therapy engages a therapist with one resident that enables the therapists to use a variety of devices to stimulate language skills. Consider providing a computer station with listening facilities in this area.

4. Hydrotherapy

There are two recommended treatment styles for hydrotherapy: extremity and therapy/resistance pools. Uses of extremity immersion are for arms, shoulders and ankles.

Therapy/resistance pools are a tool for strengthening the body, reducing pain and providing skin care.

Figure 3.40 illustrates the combination of these four major aspects of therapy into a single floor plan.

Incorporate an open center or gym area to provide flexible area for use with portable upper and lower body equipment, therapy balls, and to provide space for transfers:

Provide double doors or minimum single door 4' [1219 mm] wide entrances to accommodate residents' circulation into therapy spaces.

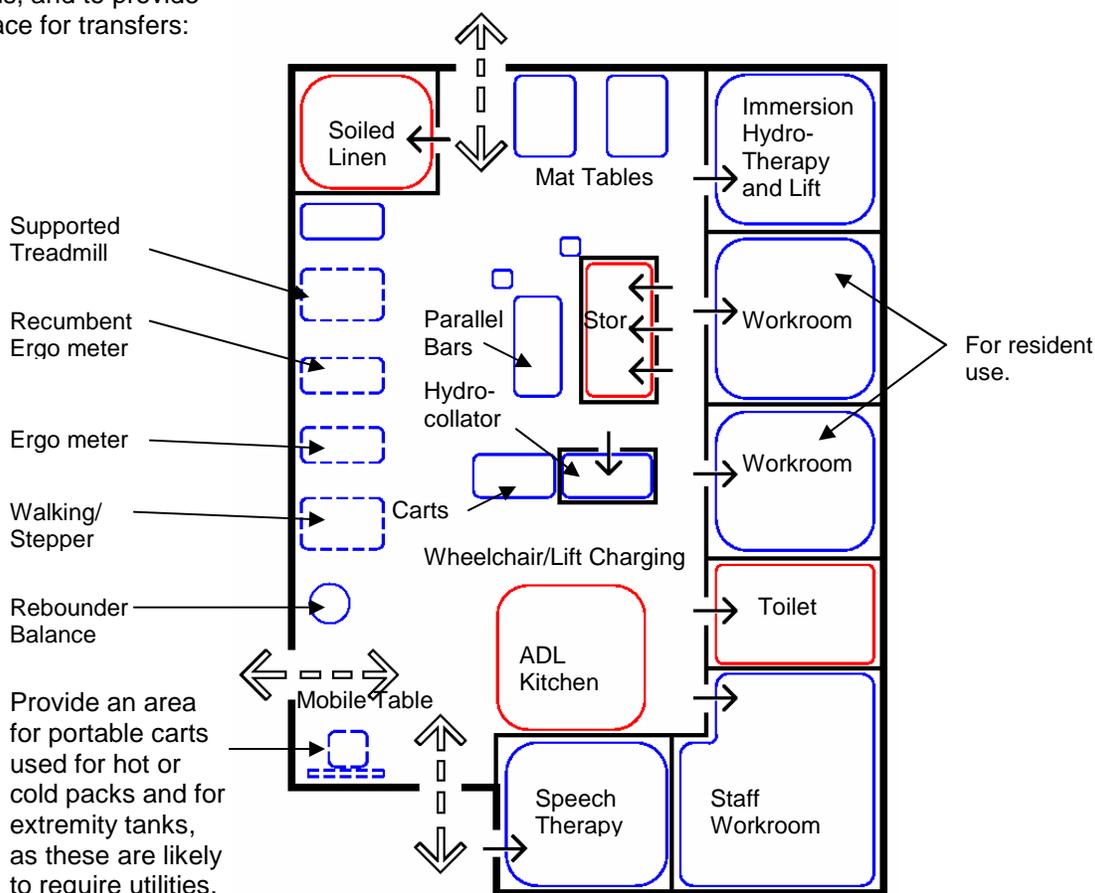


Figure 3.40

Rehabilitation Gym Therapy Plan

5. Clinic Functions

Provide clinic space when there are no acceptable alternatives such as

adjacent medical center, for equipment-intensive examinations and treatments, including dental, vision, podiatry and

similar procedures. Consider providing clinic space for other aspects of medical

care and treatment including counseling. (See Figure 3.41).

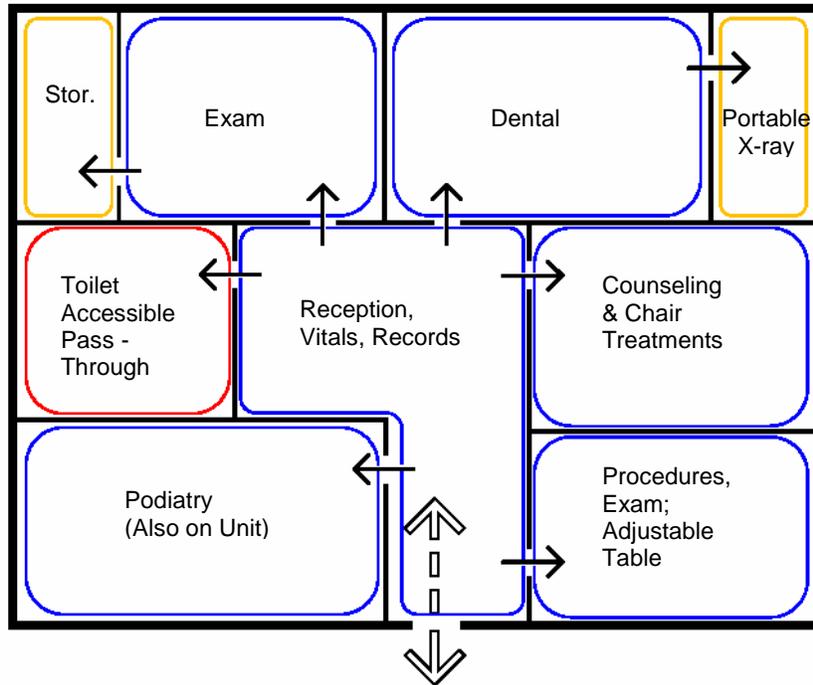


Figure 3.41

Clinic Plan
 NY State Veterans Home, Montrose, NY.

3.7.3 Design Considerations

1. Space Criteria

For a full-service rehabilitation therapy program provide a minimum space of 1,200 nsf [111.48 m²]. A modified program for small facilities (i.e., for non-Medicare certified programs) requires a minimum of 650 nsf [60.39 m²]. For small to medium facilities, those of about 130 beds, provide 24 nsf [2.23 m²] per person. Depending upon program and population focus for larger facilities, 12-20 nsf [1.12 – 1.86 m²] per person is recommended. This area does not include space required by any optional therapy or resistance pool.

Actual room dimensions and area vary with pool and water management system selected. For clinic space, including internal resident-use corridors, accommodate users in wheelchairs and those requiring transfers. Determine actual clinic size in the functional program. (See VA Space Criteria 7610 for specific requirements).

2. Private Treatment

Examples of areas that give the option of privacy are:

- Mat table treatment
- Bathroom for toilet training and/or equipment fittings
- Office for consultation or work with

- an individual who prefers solitude
- Speech therapy
- Computer use or interactive learning about particular devices with options for video or DVD training
- Use of program or features by memory or cognitively impaired individuals

3. Equipment Storage

Provide at-hand storage for large and small items including equipment and parts for adaptable, heavier, rigid equipment. (See Figures 3.42 and 3.43)



Figure 3.42

Therapy Equipment Storage
Waveny Health Care, New Canaan, CT.



Figure 3.43

Therapy Equipment Storage
NY State Veterans' Home at Montrose, NY.

4. Service Spaces

Portable water, clean linen and related clean therapy supplies; soiled linen and equipment facilities; and janitorial facilities should all be available.

3.7.4 Interior Consideration

1. Sensory Functions

The design should address the following:

- Non-glare lighting (see IESNA, 1998, RP-38-98)
- Adequate illumination
- Noise abatement
- Textural variety
- Secure floor material.

3.7.5 Systems Considerations

N/A

3.7.6 Miscellaneous

1. Identifying Equipment

Supplement passive pieces of equipment such as mat table, parallel

bars, therapy steps and/or ramps by a variety of machines with surrounding space for staff assistance and transfer. For examples of such equipment as well as larger space defining pieces, see Table 3.8. Benchmark numbers are offered, illustrating pieces of each type

of equipment found in medium-to-medium-large veterans' facilities. Adjustable and smaller profile items should address the weight bearing capacity of the residents and the bariatric needs of a veterans' therapy program.

Sample Equipment Dimensions

Equipment Example	Quantity (fill in)	Length (Depth from Wall)	Width	Height	Spacing	Comments
1 Mat Table; Low Mat Platforms	1 to 2	7'-8' [2134 - 2438mm]	4'-6' [1219 - 1829mm]	1.5 to 3.2' [457 - 985mm]	5-5.5' [1524 - 1676mm] sides, 3-3.5' [914 - 1067mm] end	Some hold only 350 lb; privacy curtain
2 Training Stairs (One Side Access)	0 to 1	2.5' to 5.4' [762 to 1651mm]	2 to 5' [610 to 1524mm]	3.3' to 4.6' [1016 to 1397mm]	5-5.5' [1524 - 1676mm] on entry/exit sides	Options for pull-out steps; other sizes 8.5' [2591mm]ht in use.
3 Rebounder(s)/ Balancers	0 to 2	3.3' [1016mm]	3.75' [1143mm]	2.6' to 5.5' [787 to 1676mm]	5-5.5' [1524 - 1676mm - entry, 3-3.5' [914 - 1067mm] assist	Staff may assist all around; ht. to 7' [2134mm] in use
4 Portable Ramp	0 to 1	3.7' to 7' [1118 to 2134mm]	3.7' [1118mm]	6' to 8' [1524 to 2286mm]		Staff on either side.
5 Treadmill(s) a. Standing Type b. Support/Suspend	0 to 1 0 to 2	5.2' to 7' [1575 to 2134mm] 5' to 6' [1524 to 1829mm]	1.2' to 3' [356 to 914mm] 5' to 6' [1524 to 1829mm]	4' to 5' [1219 to 1524mm] 6' to 8' [1829 to 2438mm]	5.5' [1676mm] access point(s); 3-3.5' [914 - 1067mm] assist zone	May position standing treadmill sideways or diagonally
6 Recumbent Bikes	1 to 2	4.7' to 6.3' [1422 to 1930mm]	2' to 3' [610 to 914mm]	4' to 5' [1219 to 1524mm]		Seat height adjusts.
7 Rowing Machines	0 to 1	7.75' [2362mm]	4.25' [1295mm]	2.2' [660mm]		Low to floor; see alternatives, below.

Table 3.8

Sample Equipment Dimensions (Continued)

Equipment Example	Quantity (fill in)	Length (Depth from Wall)	Width	Height	Spacing	Comments
8 Mini-cycles, Ergometers (movable)	1 to 4	1.7' to 2' [508 to 610mm]	1.5' to 2' [457 to 610mm]	1' [305mm]	Use seated 3-3.5' [914 - 1067mm] apart	Floor/table use: pedal and/or upper body
9 Ergometers for Upper Body (fixed)	1 to 2	5' [1524mm]	3' [914mm]	4.5' to 5' [1372 to 1524mm]	5'-5.5' [1524 - 1676mm] entry, 3-3.5' [914 - 1067mm] assist	Seat higher than recumbent bikes
10 Exercise Balls <i>Floor Rack size</i>	Set of 5	18"-30" [457-762mm] About 6' [1829mm]	2.2' to 3' [660 to 914mm]	2.5'- 7' [762 - 2134mm]	Use on mat and 5-18 sf [465 - 1672mm] gym area	5 sizes re: user height. Option: store on high shelves or floor rack
11 Soft Free Weights a. Wall mounted rack b. Portable or fixed rack on floor stand c. Wall Pulley Ropes d. Bilateral Wall Pulley	TBD 0 to 1	Rack Sz.: 5'-1' [127 - 305mm]d - 2' to 3' [610 to 914mm]d 6" [152]d, 6' to 6.5' [1829 to 1981mm] pull out and seat allowance	Rack: 2' to 3' [610 to 914mm], 2.5' [762mm]w 2' [610mm]w and 4'8" [1422mm] w	Rack: 3' [914mm] h; 5.4' [1651mm] h; 3.6' [1092mm] h 6-8' [1829 - 2438mm] from ff; 7'3" [2210mm] from ff	Used at stand, in gym or on mat 6' [1829mm] diam Sit or stand 7' [2134mm] diam to use; extend arms and legs.	Multiple sizes; can be on portable racks for use at chair or mat table Wall mount block; pull ropes to user. May ceiling mount; used sitting, standing, and supine.
12a Stall bars	0 to 1	6"-8" [152 - 203mm]d	3'-3.5' [914 - 1067mm]	8' [2438mm] from floor	Pull self up from seat	
12b Fixed point rails		6'-1' [152 - 305mm]d	3' [915mm]		5'-6" [1676mm] circle	Wall mounted; for pull-ups; require blocking.
13 Rolling Table for 1	1 to 2	3' [914mm]	3.5' [1067mm]	2.4' [737mm]	5'-6" x 30" [1676 x 762mm]	Use from chair

Table 3.8

Sample Equipment Dimensions (Continued)

Equipment Example	Quantity (fill in)	Length (Depth from Wall)	Width	Height	Spacing	Comments
14 Sturdy Stackable Chairs		1.5' to 2' [4572 to 6096]	1.5' to 2' [4572 to 6096]	16"-18" seats [4064 - 4572mm]	May need 3' [915mm] apart	Use for peddling, wet treatments; weights
15 Hydrocollator: for moist heat	1	2' [610mm]	2' [610mm]	2.4' [737mm]h	Generally docked	Mobile or fixed cart; check utility needs.
16 Whirlpool Tank(s) (Extremity use)	1 to 2	2.1' to 3' [635 to 914mm]	2' to 3.5' [610 to 1067mm]	Tank 1.3' to 2' [406 to 610mm]	Use next to a seat or mat table; otherwise docked	Some mobile; check power; plumbing; May be able to use space above carts.
17 Mobile Carts (1-3) a. For cold pack b. For paraffin	1 to 3	1.25' [381mm]	1.7' to 3' [508 to 914mm]	About 29' [737mm]h		
18 Standing Box	0 to 1	42" [1067]	38" [965mm]	42 to 54" [1067 to 1372mm]	Varies	Large; hard to move.
19 Shoulder Wheel	0 to 1	38" [965mm] dia		Arc	1' to 3.3' [305 to 1016mm] arc	Wall mount or stand.
20 Treatment Table	0 to 1	72" to 78" [1828 to 1981mm]	28" [711mm]	30" [762mm]h	3' to 4' [914 to 1219mm] around	Hydraulic option
21 Loose Mat(s)		2 to 2.5' [610 - 762mm]	4' to 6.5' [1219 to 1981mm]			Stacked in piles.

Table 3.8

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3.8 Dining and Food Service

3.8.1 General

In the Nursing Home, dining is one of the most important aspects of the resident's stay. The importance of dining ambiance including comfort, noise reduction, and a pleasant atmosphere conducive to socialization and appetite enhancement cannot be underestimated.

Resident-focused dining involves a commitment to creating a pleasant atmosphere of dining as well as offering food choices, developing appropriate menus, and planning the central production and on-unit distribution methods. Dining services have become the hallmark of the Nursing Home's commitment to resident-centered care. Not only are facilities complying with requirements for food freshness, appropriate temperatures, and safety in food handling, but also with the focus on the "culture" of Nursing Homes. Great strides have been made in developing methods for responding to resident's dietary preferences, which include relaxed dining schedules and significant attention to both the physical and social environment for eating.

Current trends favor presentation, providing a situation in which residents may smell and see their food and make their preferences known. Residents are given choices rather than having to adhere to menu selections they or others have made in advance. Fresh aromas may be particularly beneficial for residents with complex physical needs and memory deterioration. This has fueled efforts to bring a fresh, culturally

familiar, and "home style" ambiance of dining into the Nursing Home setting.

3.8.2 Planning Considerations

Among the residential model concepts that are encouraged is the use of a country kitchen concept. This includes dining/kitchen areas that are "neighborhood" based, small and conducive to encouraging residents to eat and socialize. It is desirable for residents to have access to food during the day, have a place for continual breakfast and snacks or nutritional supplements during the day.

Provide on-unit seating as the primary place for dining and/or dining within close proximity of the residents' dwelling areas. Get residents out of their rooms for eating wherever possible. An area for beverage stands, furniture, storage, and the working/display areas of the serving kitchen should be included during facility planning as per the functional program.

1. Jurisdictional Requirements

State health departments have traditionally focused great attention on food production, temperatures, handling and storage. To address regulatory concerns regarding food temperature and appearance, established dining times are set through the development of a care plan. Assistance can be obtained for the development of resident-centered dining plans from those authorities having jurisdiction. Consider sizing the dining room so that 95% of the residents, staff and some visitors can be present at one time. Issues to consider in this plan include:

- Training required for food service workers,

- Requirements on the role of a central kitchen,
- Food warming regulations,
- Fire protection,
- Dishwashing equipment and water temperatures,
- System for managing special diets.

2. Resident Functions

The resident typically receives three meals and 2-3 between-meal nourishments each day. Consider emphasis on providing residents' plates directly at a table, a course at a time, rather than food on a tray.

3. Staff Functions

Based on variations in assistance, some residents may eat in 15-20 minutes, others may be queued and selectively assisted, a third group may be fully assisted, typically one at a time rather than hand fed in groups. The closer the dining room is to the residents' rooms, the more time staff has to assist with meals. Serving includes distribution of beverages and may include presentation of the choices for the day such as an example of meals displayed on a tea cart. Although staff hand feed about 25% of residents, there is some indication that on-unit food presentation may reduce this number.

Staff provides oversight and work with those needing clinical assistance related to eating. Through training, food service and other trained staff jointly verify special diet needs and compliance. The use of computers and a more mobile dietary staff have contributed to the possibilities for such models of managing special diets.

4. Meal Distribution Options

The central kitchen generally continues

to be used for bulk preparation of vegetables, meats, combining ingredients, special diets and desserts served at noon and night. Local serving kitchens are used for completing many breakfast items, including breads and brewed beverages, prepared directly before the resident. The design of work areas for the central kitchen is the same; however, with few trays made-up in the kitchen, the need for tray lines is greatly reduced.

The models outlined here require a different training model for food service personnel and tend to result in engaging the staff as part of food presentation on a unit rather than focusing the labor force on activities within the kitchen alone. Professional consultation from peers and experienced providers is required to customize the labor model. The following are options available for resident-centered dining using local food distribution systems:

Food Service

There are 3 food service systems recommended for a Nursing Home facility:

- *Country kitchen systems* where food is delivered in bulk, generally to the less visible portion of the unit pantry. This happens in advance of the meal.
- *Bulk-based systems* where food service staff may prepare all or a portion of the meal on a plate and set it before the resident at his or her table.
- *Tray-based systems* with some selection where trays arrive with certain items set-up in the kitchen.

The dining room may be in operation for

2 hours at breakfast, 1-2 hours at lunch and 1 hour in the evening. To maximize food service staff time, dishwashing of residents' dishes and utensils is done on the unit or between two pantries, using appropriate equipment and meeting requirements for water temperature. It is common for food service staff to interact with the residents during dining and participate with nursing assistants in some of the beverage distribution and clean-up.

- Clean-up
- Maintaining high standards of orderliness and safety in food handling
- Information management
- Quality control and supervision
- Safety - particularly in terms of floor covering
- Room temperature and plans for HVAC, relative to maintaining food temperature.

Central Kitchen (See Figure 3.44)

With the assistance of professional food service consultants, kitchen design should identify how the following operations will be accomplished:

- Receive inventory
- Delivery and distribution or serving

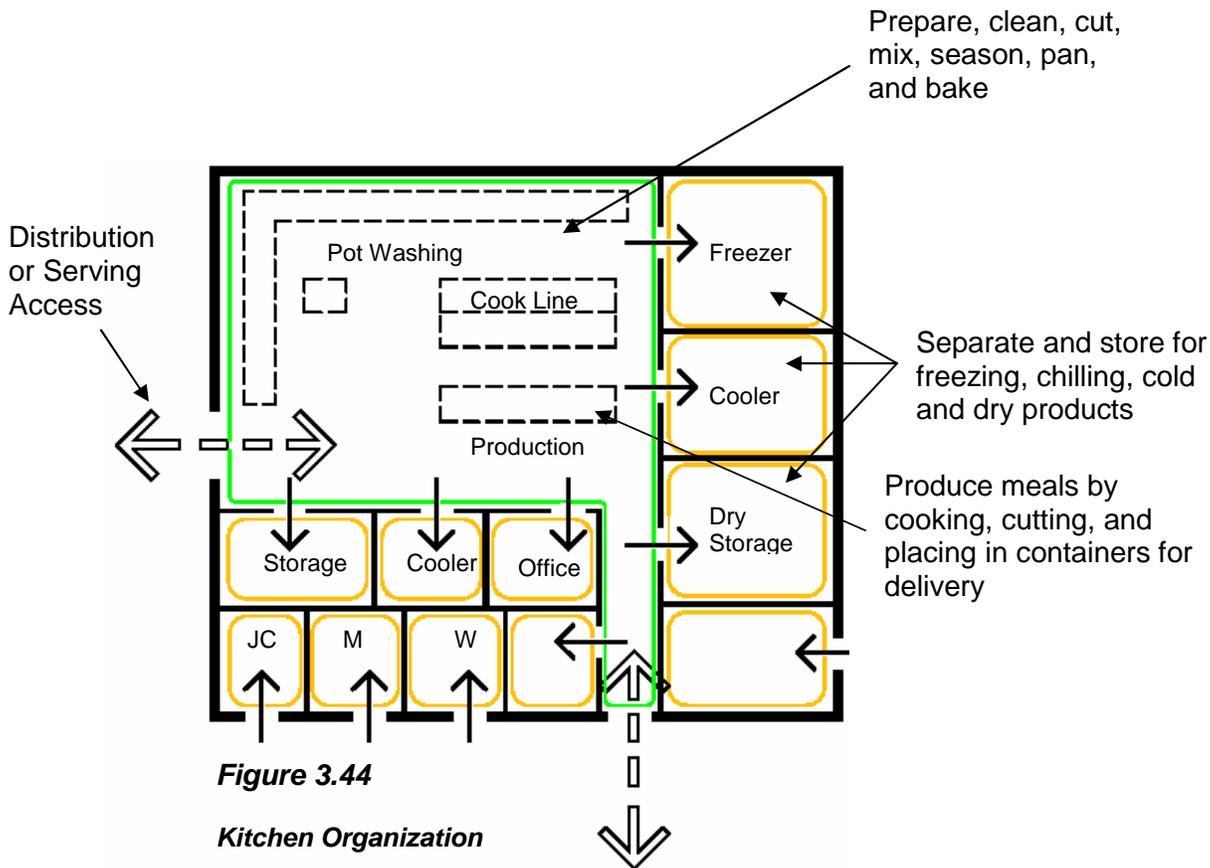


Figure 3.44
Kitchen Organization

Cook Chill Production Options: Central Kitchen and/or Off-Site.

Nursing Homes generally have full kitchens. However, labor shortages in some markets have motivated sponsors to consider new methods for consolidating cooking times and production schedules. The experience with cook chill methods in resident-centered Nursing Homes with selective menus are relatively recent. The following are methods of food preparation:

- Method One - the food comes to units in special carts on trays where it is warmed for serving, releasing some cooking aromas.
- Method Two - cook chill is one production technique, used for some meals and special diets; some breakfast menus have been particularly challenging to satisfy requiring alternatives to cook chill.
- Method Three - cook chill production is used for bulk preparation and plating occurs on resident units.

3.8.3 Design Considerations

Design for more residential dining experiences in the Nursing Home may focus on four areas. However, even these areas may be affected by individual decisions, including the preparation of some food off-site or the selective use of cook chill as part of the

sponsor's service delivery system. Residential food service design typically addresses the following:

1. *Central Kitchen*

In addition to equipment specification and layout, kitchen planning must address specific operational implications of resident-centered dining, details affecting floor safety, and high standards of sanitization.

2. *Decentralized Food Service Pantry or Serving Kitchens*

Planning on-unit food service should address four functions: (See Figure 3.45).

- *Function 1: Work Area.*

The work area includes commercial equipment such as a freezer, reach-in coolers, institutional sinks and may include dishwasher, cart storage, and dry food storage. Depending upon decisions on the heating of food, the work area or the display kitchen may have facilities for heating including a grill or combination oven. It will also include a handwashing station. The work area has direct access to a service corridor or central spine of the building so that food can be delivered and pots or pans removed with minimal impact on resident living areas.

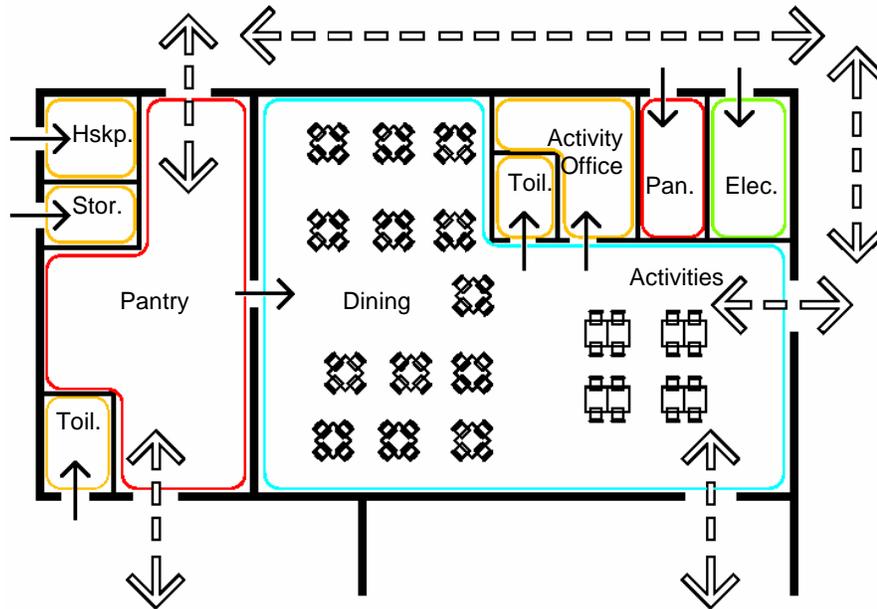


Figure 3.45

Pantry Service and Adjacent Dining Rooms

- **Function 2: Fresh Food Display Kitchen or “Country Kitchen”**
 This area is directly connected to the work area and contains more residential appearing equipment and facilities to plate food. (See Figure 3.46) Standard items include the following:
 - Steam table with enough wells to provide choices for the residents;
 - Plate raising equipment
 - Cold table
 - Soup wells or area for kettles and serving
 - Reach-in refrigeration
 - Work area for some items to be “prepared” to offer alternatives to the food delivered from the kitchen
 - Microwave or convection oven.



Figure 3.46

Staff Area of a Display Kitchen
 Messiah Village, Mechanicsville, PA.

- **Function 3: Beverage and Ice**
 Residential looking beverage bars may be out in the dining area for use by nursing staff and residents throughout the day to fulfill hydration needs and requirements. (See Figure 3.47) These areas also may be used for condiments, breakfast

items, serving equipment and tableware and decorations. Special attention needs to be given to selection of ice machines and location of ice in bulk. The goal is to minimize machine background noise and to respond to the needs of the nursing and food service staff as well as the higher functioning residents for gaining access.



Figure 3.47

Beverage and Condiments Storage Area
Peabody Health Care, Manchester, IN.

- **Function 4: Handwashing**
Provide handwashing stations in the display kitchen and in the working areas behind them. These stations are designed into dining rooms for resident and staff convenience.

3. On-Unit Dining

Refer to Section 3.6 earlier in this section, which provides a basis for sizing dining rooms, and service aisles and consider the following: (See Figure 3.48)

- Provide 36 nsf [3.35 m²] per person to accommodate wheelchair users and aisles.
- Provide 28 nsf [2.60 m²] per person on units serving a predominantly ambulatory population.
- Provide noise abatement and other sensory experiences of the dining space.

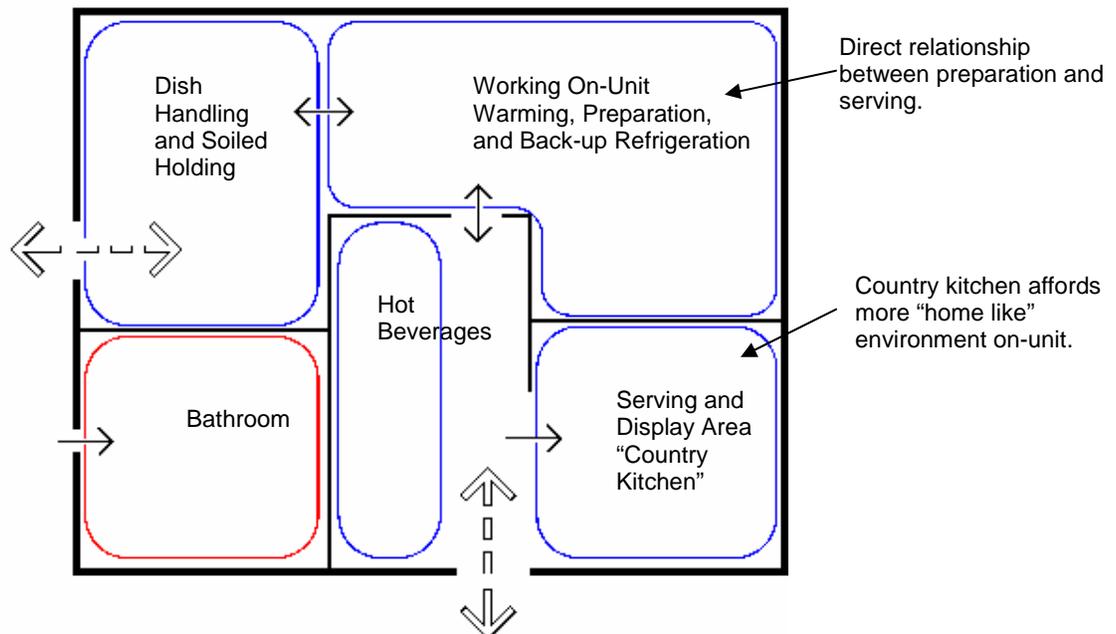


Figure 3.48

On-Unit Serving Kitchen

4. Option for Canteen

A canteen should be used primarily by staff and visitors. It can also serve as an alternative venue or destination for resident off-unit snacks, vending or eating.

5. Nourishment Station Requirement

Many jurisdictions require that nursing staff have 24-hour access to a facility for nourishments, ice and beverage service. These facilities are increasingly “designed” as part of the dining room, on-unit dens, or great rooms with appropriate methods for securing food products and securing the controls for any heating devices.

6. Other

Other issues for design include staff dining, special events, outside eating, and improved methods concerning special diets, ADL kitchens, activity kitchens, bariatric dining, and enteral feeding.

3.8.4 Interior Considerations

Lighting requirements should include 500 lumens and 50 foot candles for eating areas. Refer to Part 2.0 Section 2.3 for further lighting recommendations.

3.8.5 Systems Considerations

N/A

3.8.6 Miscellaneous

1. Major shifts in food presentation have resulted in altered methods of operation. More relaxed meal schedules, less rushed resident transport, more choices in food items and quieter, sensory rich dining experiences have contributed to the

sense that there is more time to address residents’ needs, thereby helping restructure daily routines. Relaxed dining makes it more feasible to be resident-focused than schedule-driven. It was once an accepted practice to produce food in a central kitchen, place it in uniform and covered vessels on institutional-looking trays, and deliver all or most of the meal at once to a group of assembled and waiting residents. The basis for this system was a series of concerns regarding food temperature, appearance, and safety in handling. However, with industry averages of 45 minutes from the time food was portioned in the kitchen to when it reached the residents, food deterioration was a continuing struggle.

If it is necessary to provide selective pantry service, priority should be considered for heavy care residents including:

- Residents whose life experiences are primarily sensory and are receiving palliative care
- Residents with attention deficits such as those who are active and have Alzheimer’s disease or related disorders,
- Residents receiving hospice care who may not eat traditional foods or meals.

Breakfast is notably improved by successful decentralized food programs, since residents have more flexibility in orchestration of their morning care and dietary needs. Breakfast consists of an initial “continental” approach. Beverages and fruits can be delivered to the residents’ great room or unit “den” at dawn for early risers, followed by morning care and subsequently a warm breakfast in the dining room.

Meanwhile, other residents may prefer a later start and only a warm breakfast.

2. Statistics

Nationally, about half of all Nursing Home residents (54%) eat independently.

Of those assisted, 21% are described as fully dependent, and the other 25% are partially assisted.

About 37% eat mechanically altered diets.

Of all residents, a small proportion receive special treatments affecting the ability to eat, including 7% who are “tube fed,” 9% using assistive devices, and 2% who receive suctioning.

3.9 Linen and Materials Management

3.9.1 General

A good linen and materials management program operates in the background, ensuring that residents are less aware of the personal service needs of others and focused on more stimulating and satisfying aspects of daily life.

The purpose of this chapter is to identify the issues of linen and materials management, including location, storage and convenience. Methods for estimating linen and storage are included in Table 3.9 at the end of this section.

3.9.2 Planning Considerations

1. *Volumes*

National laundry associations estimate that Nursing Home residents produce about 10-13 lbs. of laundry per person per day.

2. *Clean Linen*

Clean linen refers to loose or bagged sheets and towels; pre-packaged incontinence supplies; and freshly laundered personal clothing.

3. *Soiled Linen*

The following items are deemed soiled:

- Used sheets, towels, wash cloths
- Worn clothing
- Opened items (towels, cloths)
- Yellow bag material (human waste), which is unhealthy for staff to rinse
- Red bag material (medical waste).

4. *Clean and Soiled Linen Room Sizes* Consider the option of taking overall

requirements for central linen space and dividing this up into smaller, well-located utility areas. Verify with local jurisdictional authorities.

5. *Personal Clothing and Items*

Requirements referring to the management of residents' personal soiled linen vary by jurisdiction and may include:

- Storage in sealed or labeled net bags, kept in a closed container in the resident toilet room, and should not encumber access.
- Bagging in plastic or net and stored in a ventilated soiled linen room.
- Soiled linen storage for personal garments also generally requires a ventilated area not typically provided in a resident room closet.
- Handbags, backpacks, extra shoes, residents' personal clothing, flowerpots, holiday decorations, wheelchair parts, and oxygen concentrators are neither clean nor soiled items.

6. *Bedpans*

- If washable bedpans are incorporated in the plan of care, facilities need to be available for washing and sanitizing, while protecting staff and other residents.
- Disposable bedpans are generally preferred by residents and staff.

7. *Fire Protection*

Alcoves are appropriate for conveniently locating clean linen and supplies, though they must maintain access to a sprinkler head.

8. Universal Precautions

The Center for Disease Control (CDC) and OSHA each address aspects of contact with potentially infectious materials. Address the following:

- Minimize staff handling of soiled linen
- Design to reduce the need to touch door handles and faucets.

9. Ventilation

Linen storage should meet prevailing ventilation requirements.

10. Disposables

The option for using disposable incontinence products may be controlled through local ordinances covering waste management.

11. Recycling

As more Nursing Homes turn to bottled water for residents' hydration needs, consider recycling.

3.9.3 Design Considerations

1. Clean Linen

Provide clean linen rooms or alcoves between the work assignment areas of pairs of nursing assistants, or on each hall. (See Figure 3.49) Store linen on washable wire carts rather than shelves. A linen cart for 14 to 21 individuals averages 42" w x 26" d x 54" h [1067 mm x 660 mm x 1372 mm]. Provide 12-24" [305 x 610 mm] clearance to the walls on either side of the cart(s) chosen, to be used for hanging articles of back-up clothing or lift slings on loops or hooks.



Figure 3.49

Clean Linen Alcove with Doors

CO State Veteran's Home Fitzsimons, CO.

Limit heights of clean linen and supply carts to 4'-6" [1372 mm], so staff will have a less obstructed view of people and other equipment as they wheel through the halls that residents occupy. Consider use of mid-sized carts for off-loading fresh linen, and larger carts in the clean linen storage alcoves.

2. Soiled Linen/Utility Room

Soiled laundry should be collected in appropriately sized and sealed containers such as small, frame style, wheeled carts with lids, or in larger, wheeled barrels, (50 gallons) for about 25-35 lbs of linen.

The volume, frequency of pick-ups, sizes and numbers of containers define soiled linen space needs. Provide containers for each of the following:

- soiled clothing
- flat items of linen, trash, and medical waste.

Reduce the prominence of soiled utilities by designing for smaller containers,

functionally located throughout a unit. Refer to Table 3.9 at the end of this section for assistance in translating containers, resident volumes and storage implications.

Appropriately contain soiled linen by bagging as each individual is dressed, toileted or otherwise given personal care. Do not pre-wash any items; this should be done in institutional grade washers specified with extraction systems.

Provide separate containers for medical waste, soiled flat goods, paper or disposable products, and soiled clothing. Soiled utility work rooms provide equipment and facilities for dealing with special linen needs, including bedpan flushing and/or sanitizing equipment as required. (See Figure 3.50)

For low volume of use, consider disposable bedpans. Comply with regulations regarding requirements for bedpan flushers. Where provided in soiled utility workrooms, bedpan washing should be managed in an enclosed system such as using a rigid arm, flush rim sink with a method for controlling splatter.

Provide conveniently located hand-washing sinks and disposable anti-microbial wipes on exit route for use prior to touching door hardware or other surfaces. (See Figure 3.51)



Figure 3.50

Open Plan Soiled Linen Room
The Highlands, Wyomissing, PA.



Figure 3.51

Soiled Linen Room
Village Shalom, Kansas City

In most jurisdictions, linen and trash chutes with appropriate sprinkler and cleaning systems may be used in multi-story Nursing Homes.

3. On-Unit Supplies

There are at least two types of supplies that require accommodation on Nursing Home units:

- Clean personal supplies are used by nursing assistants and include small products like shampoos and lotions. Par stock should be provided on each unit; individual items, assigned

to a resident, may be located near where they are used, such as in bathing suites or individual resident bathrooms. (See Figure 3.52)



Figure 3.52

Clean Personal Care Supplies

CO State Veterans Home at Fitzsimons, Aurora,

- Clean medical supplies are generally controlled and used by licensed staff. Clean medical supplies should be provided on each unit. They may be stored in distinct supply rooms, medication rooms and/or in alcoves, depending upon the volumes, frequency of deliveries, and the goals for product control. (See Figure 3.53)

4. Oxygen Storage and Medical Gases

Oxygen use should be available on each unit. This may be accomplished using concentrators, portable canisters and/or piped-in oxygen, depending upon the anticipated diagnoses of residents, access to supply, and functional program.



Figure 3.53

Clean Medical Supplies

Baltimore Rehabilitation & Extended Care Center, Baltimore, MD

- Tanks of other compressed gases such as nitrogen may be stored with concentrators; however, nothing else should be stored with or stacked on top of oxygen tanks and equipment.
- To supplement this storage, provide an emergency tank at the staff stations and on crash carts, located near multi-function social halls and larger dining rooms.
- Provide an 80 nsf [7.43 m²] on-unit oxygen storage room. (See Figure 3.54). Provide one central oxygen storage room in facilities with multiple nursing units. Size this area according to the functional program.

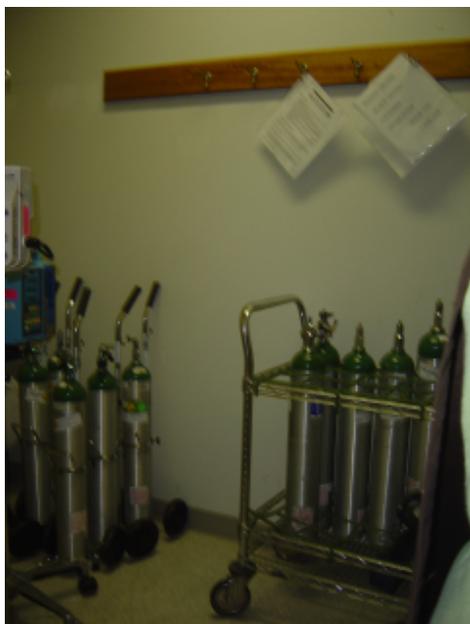


Figure 3.54

Oxygen Canister Storage
 Armed Forces Retirement Home
 Washington, DC.

5. Integrating Linen, Supplies and Unit Design

Good design responds to service item use and storage, product volumes, carts selected, and inconspicuous, convenient locations. Solutions would include:

- Equipment that supports the residential character of the surroundings
- Alcoves or off-sets (See Figure 3.55)
- Floor plans that minimize bulky linen collection traffic in resident use areas by using small local carts, taking routes through less public areas and/or use of linen chutes
- External pick-up using small carts. (See Figure 3.56)

On-unit washers and dryers are also encouraged as a means of establishing independence of residents.



Figure 3.55

Alcoves Used for Active Equipment Needs
 CO State Veteran's Home Fitzsimons, CO.



Figure 3.56

Exterior Linen Pick-up Using Battery Carts
 Moorings Park, Naples, FL.

3.9.4 Interiors Considerations

N/A

3.9.5 Systems Considerations

N/A

3.9.6 Miscellaneous

Many sponsors prefer to design less obtrusive soiled linen systems. One

way to accomplish this is by using smaller, less institutional looking carts and more points of pick-up. Use Table 3.9 to estimate linen cart and space needs as well as to plan central or

shared soiled linen pick-up alcoves and soiled utility rooms.

Soiled Linen Management and Space Needs.

Number of Residents	Est. Weight (All types at 6 to 11 lbs. each)	Small Framed, Wheeled Carts. Number of 39 Gallon Linen Carts (1)	Large Wheeled Barrels, Number of 50 gallon barrels (2)
7 to 8	42 to 88	3 to 4 based on what is separated; 1 to 2 pick-ups.	2 assuming separation of soiled flat linen, soiled personal laundry and trash
14 to 16	84 to 176	4 to 6; 2 pick-ups per day	2 to 3; 2 pick-ups per day
21 to 24	126 to 264	6 to 8; 2 pick-ups	3 to 4; 2 pick-ups per day
35	210 to 385	See barrels; staff would probably also park 12 to 16 carts in the hall	3 to 4; 3 pick-ups; volume beings to affect air quality
40 to 45	240 to 795	12 to 16 with 2 pick-ups per day	4 to 5; 3 pick-ups per day to manage volume and help air quality
60	360 to 666	24 to 32 carts with 2 to 3 pick-ups per day	4 to 6; 3 pick-ups per day; staff would put some containers in halls. See above.

Table 3.9

Notes:

- 1 Average size = 22”l x 20”d x 32” to 40”h; Each holds about 15 lbs. dry, or 13 lbs. damp
- 2 Each holds 25 lbs. dry or 22 lbs. damp

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Study Site Facilities

This section provides examples of facilities studied during the VA Nursing Home Design Guide development. The purpose of these site summaries is to provide an at-a-glance tool when planning a Nursing Home care facility. The objective is to aid future planners, designers and administrators of VA Nursing Home care facilities in providing top quality healthcare environments that are well designed and constructed to provide state of the art services to VA clients.

Study Site Summary Table (Table 3.10) provides a summary of the study site information and includes:

- Total Beds
- Total Square footage of the facility
- Number of beds per Nursing Unit
- Approximate facility acreage
- Number of beds per acre
- Any specialty care units

The floor plans are color coded according to important spatial relationships as well as facility functions. A checklist is provided at the end of each study site subsection and includes a concise listing of critical information from each facility for planning purposes.

No.	Name/Location of Facility	Total Beds	Total SF	Beds/Unit	Acres	Bed/Acre	Special Units
1	Baltimore Rehabilitation & Extended Care Center/ Baltimore, MD	120	62,938	60	10.16	11.8	Geropsych; Alzheimer's
2	State Veterans Nursing Home at Fitzsimons/ Aurora, CO	180	126,072	45	10.7	16.8	
3	Delaware Valley Veterans Home/ Philadelphia, PA	170	110,148	40	16.7	10.2	
4	Hawaii State Veterans Home/ Hilo, Hawaii	119	59,000	48	5.5	21.6	
5	New York State Veterans Home/ Montrose, NY	252	158,094	42	22.6	11.2	Dementia
6	Oklahoma Veterans Center/ Lawton, OK	50	26,295	30	2.57	19.5	

Table 3.10
Study Site Summary

No.	Name/Location of Facility	Total Beds	Total SF	Beds/Unit	Acres	Bed/Acre	Special Units
7	Delaware Veterans Home/ Milford, Delaware	144	107,687	40	22.9	6.3	Dementia, Dom
8	Washington State Veterans Home/ Retsil, WA	240	175,425	20	11.6	20.7	SNF, Dom & Assisted Living
9	Western Kentucky Veterans Center/ Madisonville, KY	120	82,017	40	16.8	7.1	
10	Armed Forces Retirement Home/ Washington, DC	200	233,520	24	5.16	38.8	
11	New York State Veterans Home/ Oxford, NY	242	214,235	42	6.9	35.1	Dementia
12	Adult Care Facility at Veterans Home/ Rocky Hill, CT	125	39,707	25	10.9	11.5	Dementia

Table 3.10 (cont'd)
Study Site Summary

1. Baltimore Rehabilitation & Extended Care Center

Baltimore, MD

Architect: CHK Architects & Planners, Inc.

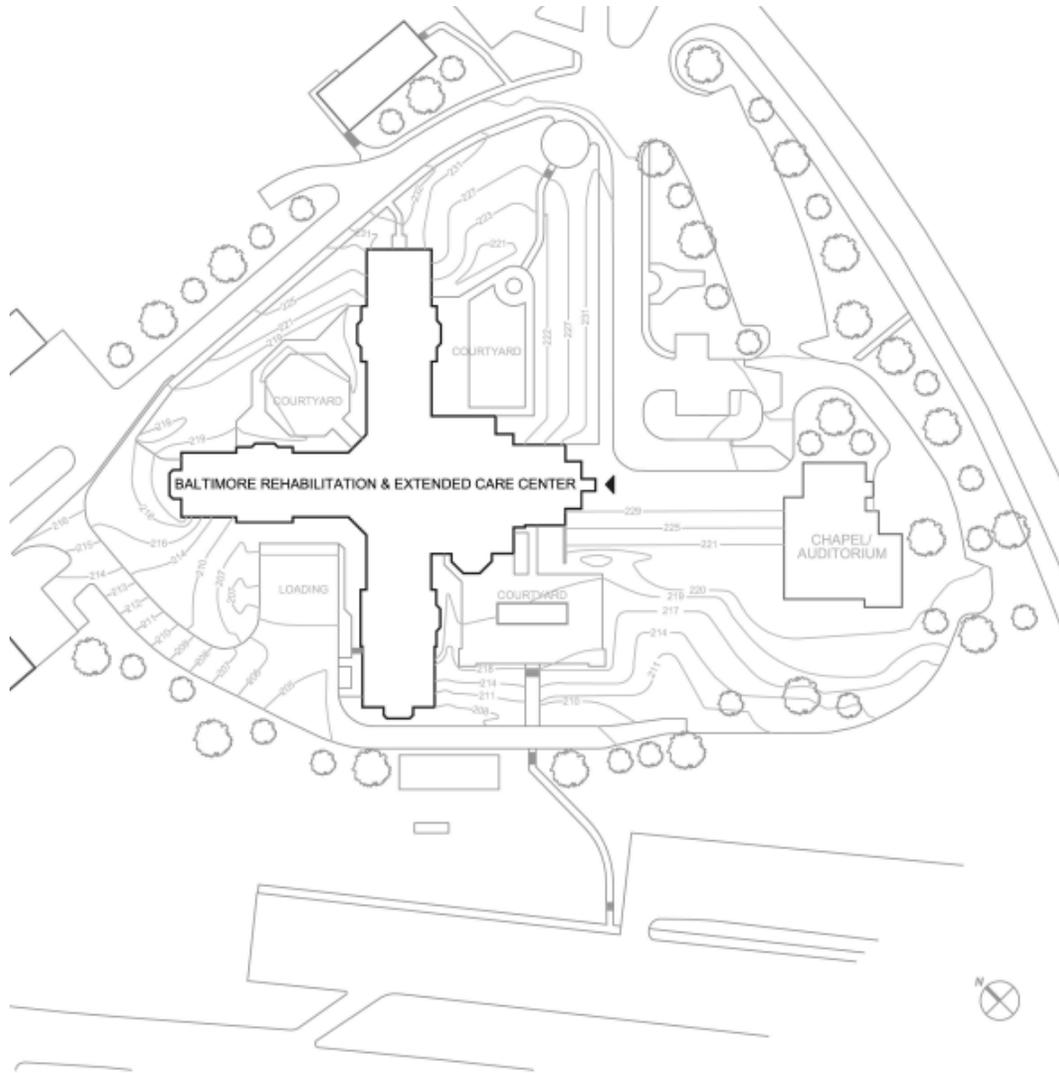
Acreage: 10.16 acres

Stories: 2

Geographic Location: Mid Atlantic U.S.A

No. of Beds: 120

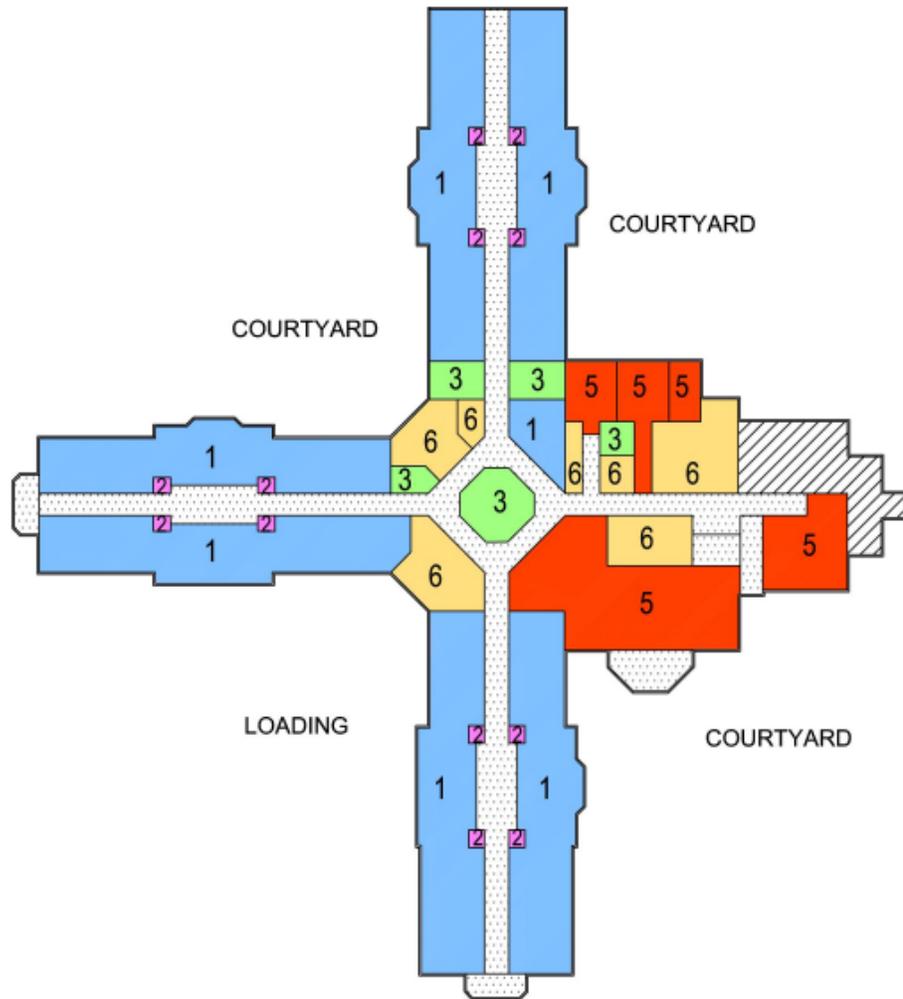
Squarefootage: 62,938 sq. ft.



Site Plan

NTS

1. Baltimore Rehabilitation & Extended Care Center
 Baltimore, MD

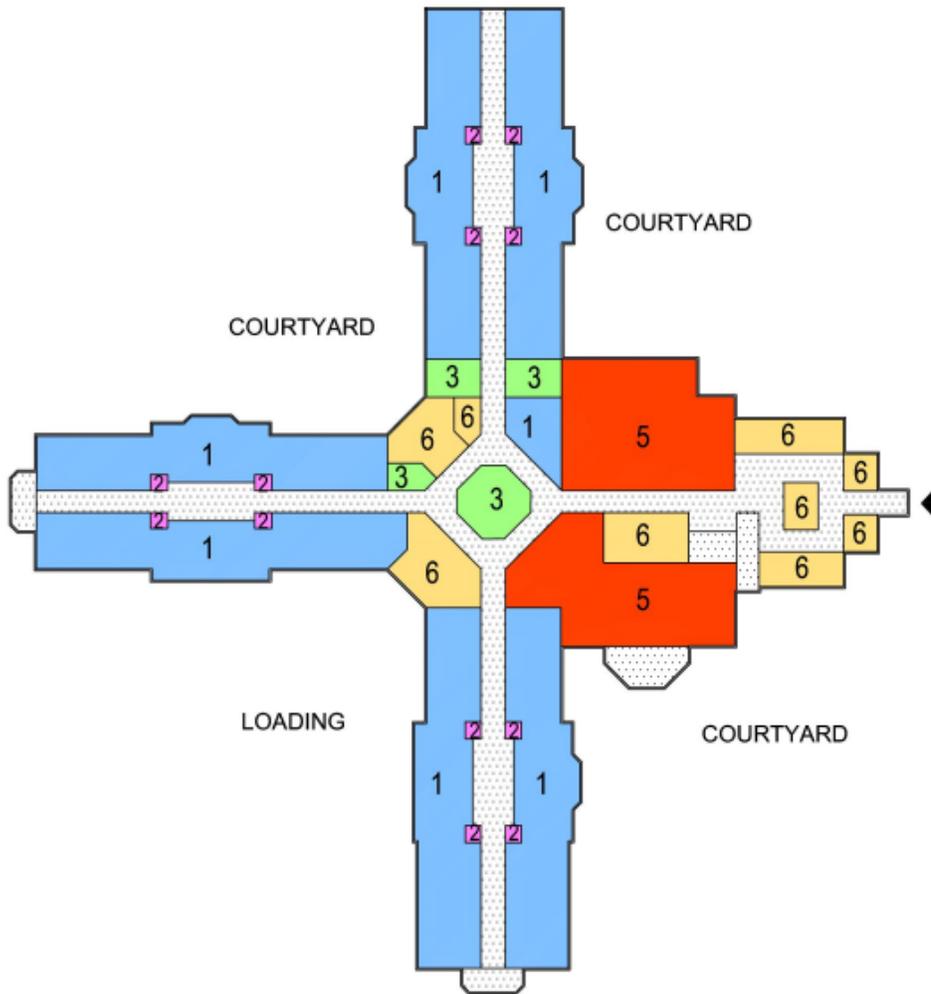


Level 1 Floor Plan



- LEGEND**
- | | |
|-------------------------|-----------------------|
| CIRCULATION | 4 ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

1. Baltimore Rehabilitation & Extended Care Center
 Baltimore, MD



Level 2 Floor Plan



LEGEND

- | | |
|-------------------------|-----------------------|
| CIRCULATION | 4 ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

FACILITY NAME: <i>Baltimore Rehabilitation & Extended Care Center</i>		
Facility #1		
Geographic Location:	Mid Atlantic US	
Number of NHC Beds:	120	
Number of Stories:	2 + Basement	
Building Footprint Area	31,469 sf	
Number of Parking Spaces:	unassigned to building	
Acreage (2) :	10.16 acres	
SF of Facility (1) :	62,938 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	18 bed average on First Floor; 22 bed average on Second Floor	X
Storage	Residents need more personal storage space	O
Flexible Plan	Yes	X
Type of Dining	Dining facility on each floor	N
Social Activity	Recreation Room, Lounge, Wander Garden, Smoking area	F
Resident Support Areas	Laundry, On-Unit Kitchen, Quiet Room, Physical and Occupational Therapy,	O/F
Bathing Options	In room showering as well as Congregate Bathing on-unit	O
Resident Rooms	Primarily 2 bed rooms, consisting of a shared lavatory and toilet. 3 Single Bed rooms per unit.	X
Loop Service Road	Yes	X
Mechanical Room	In Basement	F
Receiving Areas	Away from Main Entrance	X

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

2. State Veterans Nursing Home at Fitzsimons

Aurora, CO

Architect: Boulder Associates

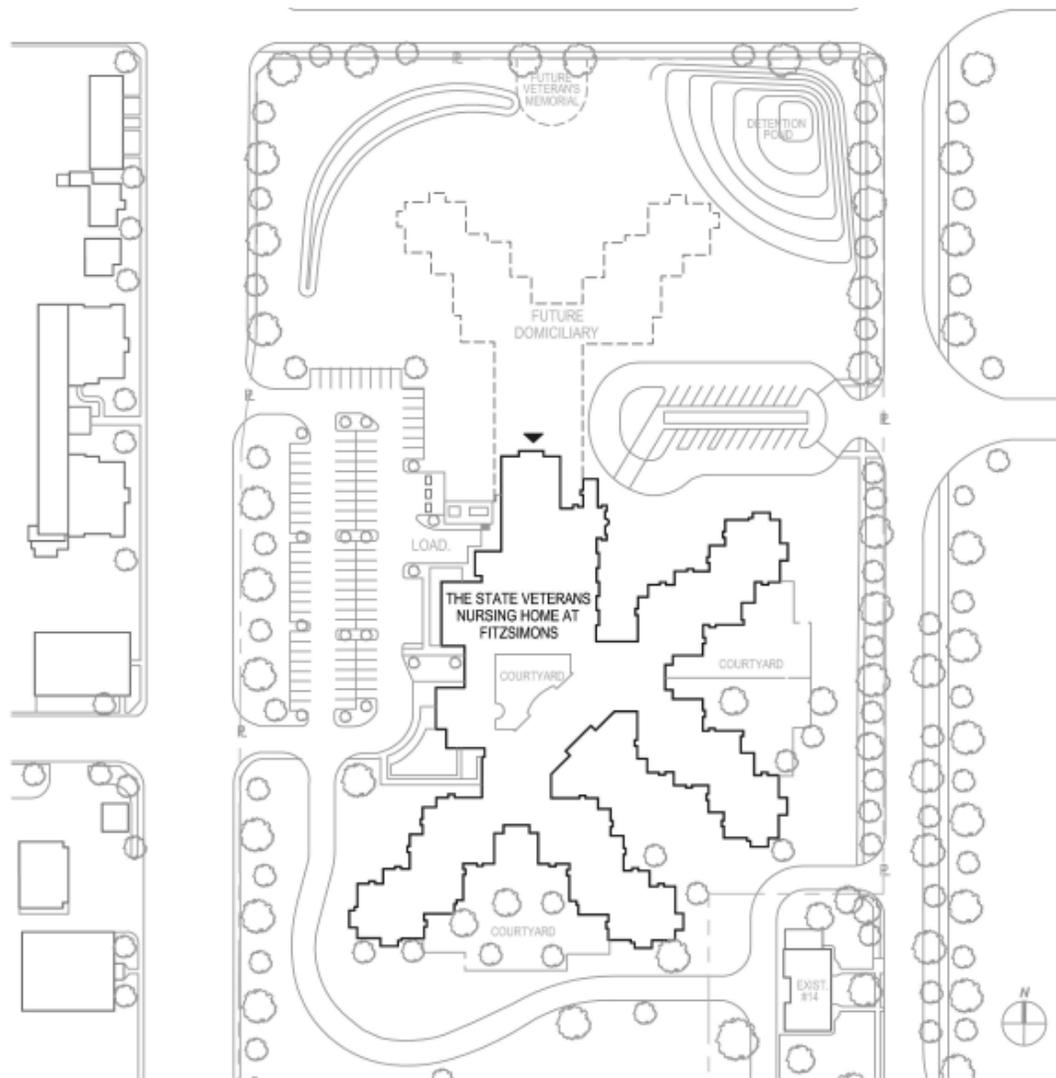
Acreage: 10.7 acres

Stories: 2

Geographic Location: Central U.S.A.

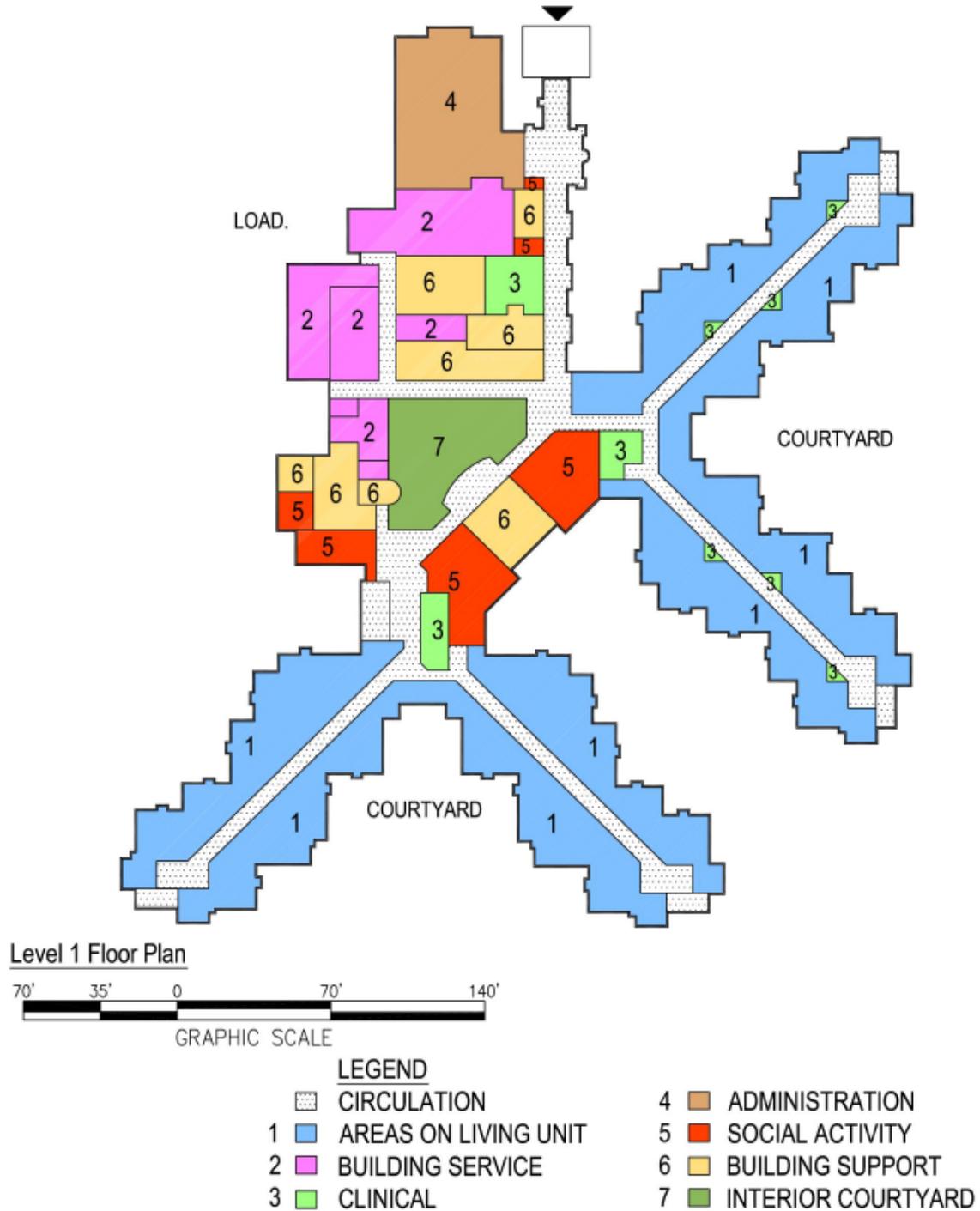
No. of Beds: 180

Squarefootage: 126,072 sq. ft.

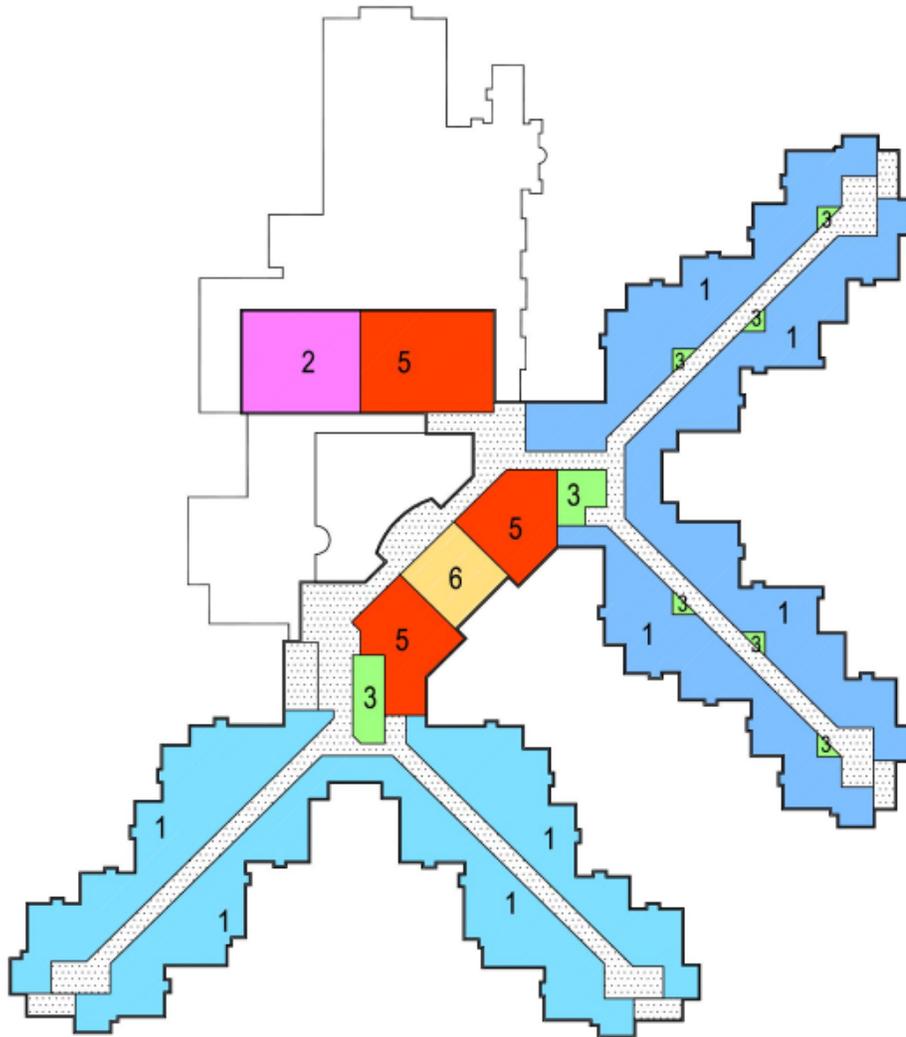


Site Plan
NTS

2. State Veterans Nursing Home at Fitzsimons
Aurora, CO



2. State Veterans Nursing Home at Fitzsimons
Aurora, CO



Level 2 Floor Plan



LEGEND			
	CIRCULATION		ADMINISTRATION
	1 AREAS ON LIVING UNIT		5 SOCIAL ACTIVITY
	2 BUILDING SERVICE		6 BUILDING SUPPORT
	3 CLINICAL		7 INTERIOR COURTYARD

FACILITY NAME: State Veterans Home at Fitzsimmons	
Facility #2	
Geographic Location:	Central US
Number of NHC Beds:	180
Number of Stories:	2
Building Footprint Area	63,036 sf
Number of Parking Spaces:	98 Staff and 22 Visitor
Acreage (2) :	10.7 acres
SF of Facility (1) :	126072 gsf

FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	2 Nursing Units per floor (42 and 48 Bed Units)	X
Storage	On-Unit needed; sufficient off-unit storage	F
Flexible Plan	Yes	X
Type of Dining	On-Unit Dining	O
Social Activity	MultiPurpose Activity on Unit	F
Resident Support Areas	Therapy areas, Outdoor patio Areas	O
Bathing Options	Congregate Bathing	O
Resident Rooms	Mainly 2 bed rooms with shared toilet room	X
Loop Service Road	Yes	X
Mechanical Room	Off of Therapy Room on Second Floor	F
Receiving Areas	Located away from Main Entrance	F

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

Note:

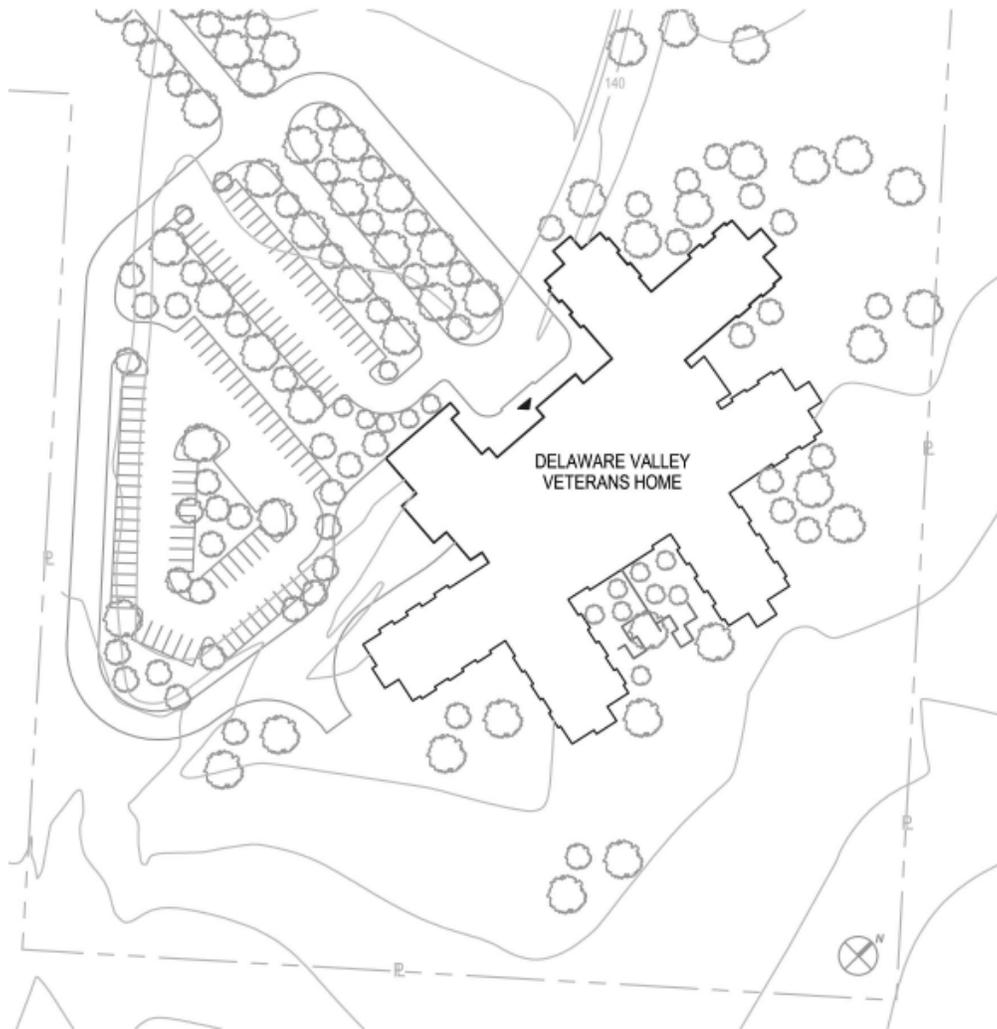
- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

3. Delaware Valley Veterans Home

Philadelphia, PA

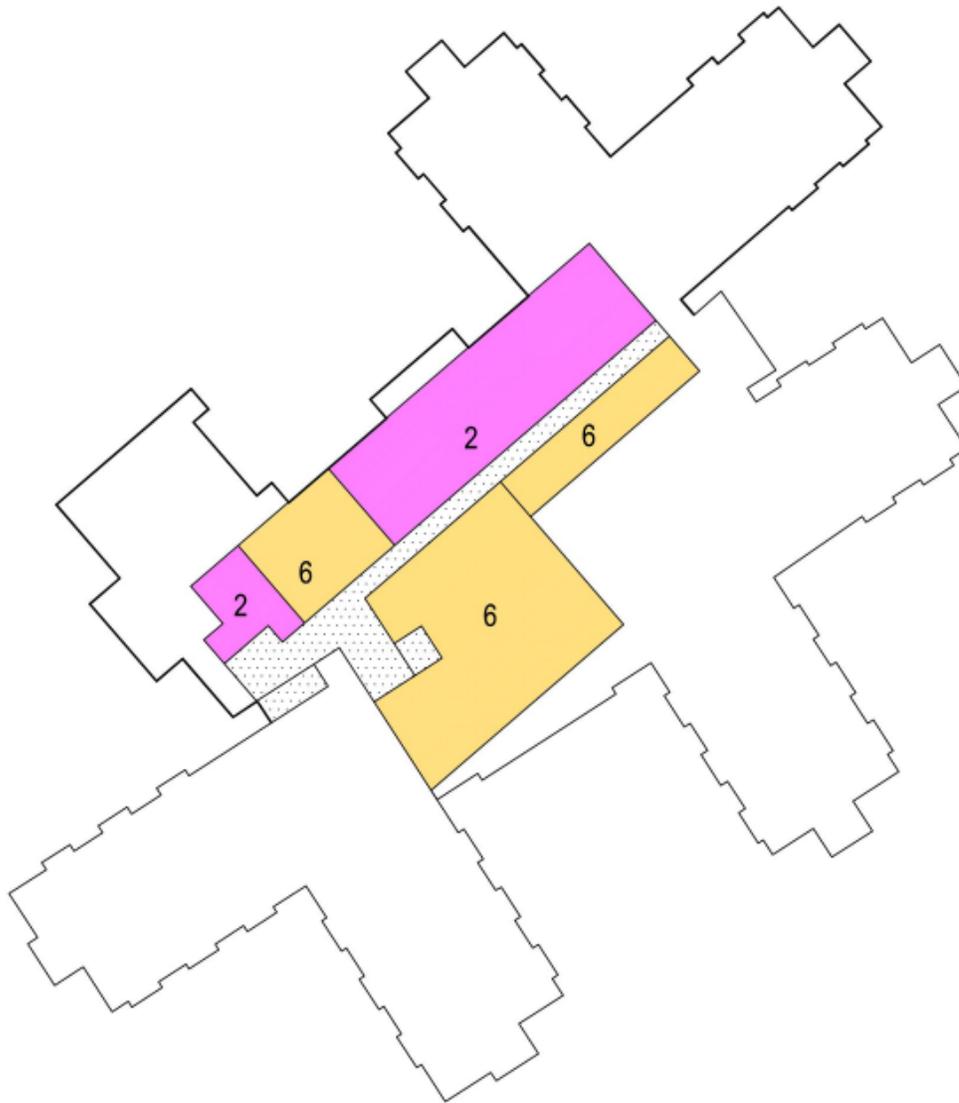
Architect: GBQC Architects IKM Inc.

Acreage: 16.7
Stories: 2 + Basement
Geographic Location: Northwestern U.S.A.
No. of Beds: 170
Square Footage: 110,148 sq. ft.



Site Plan
NTS

3. Delaware Valley Veterans Home
Philadelphia, PA



Basement Floor Plan

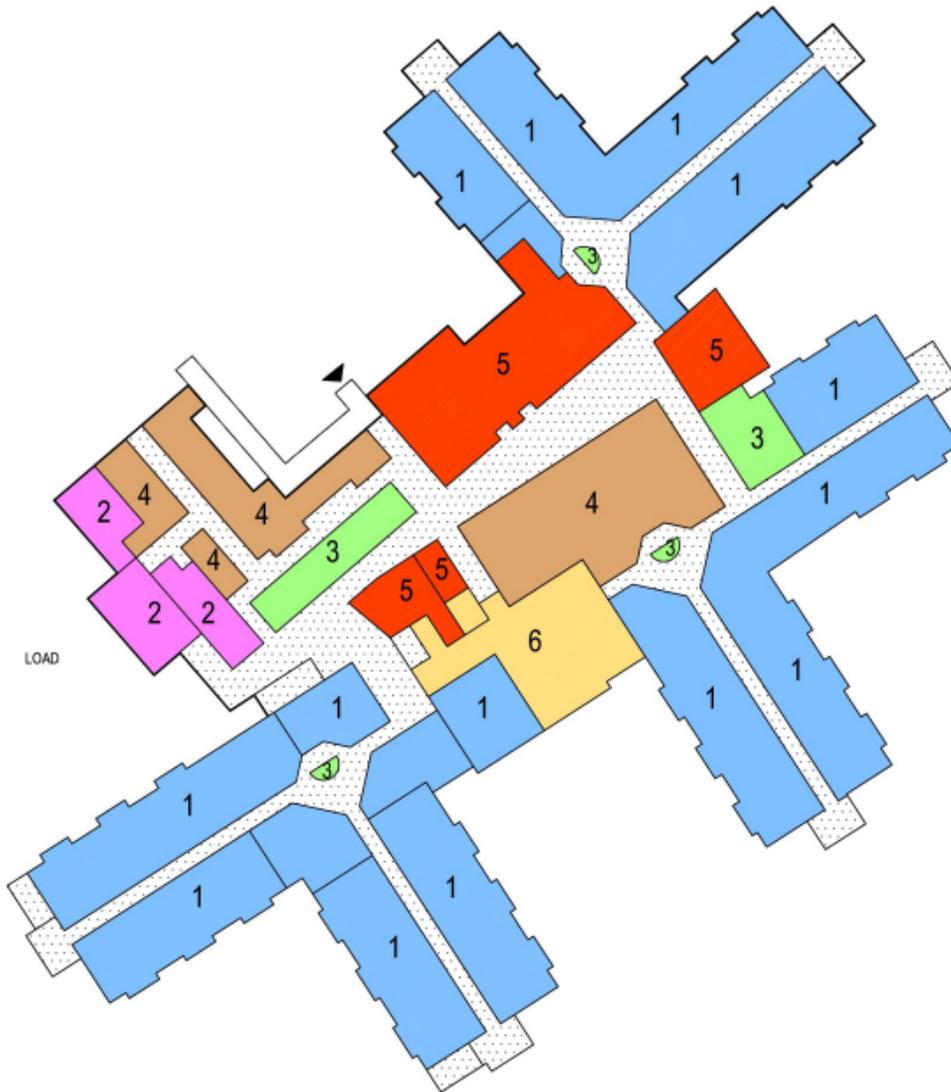


GRAPHIC SCALE

LEGEND

- | | | | |
|---|----------------------|--|--------------------|
|  | CIRCULATION |  | ADMINISTRATION |
|  | AREAS ON LIVING UNIT |  | SOCIAL ACTIVITY |
|  | BUILDING SERVICE |  | BUILDING SUPPORT |
|  | CLINICAL |  | INTERIOR COURTYARD |

3. Delaware Valley Veterans Home
Philadelphia, PA



Level 1 Floor Plan

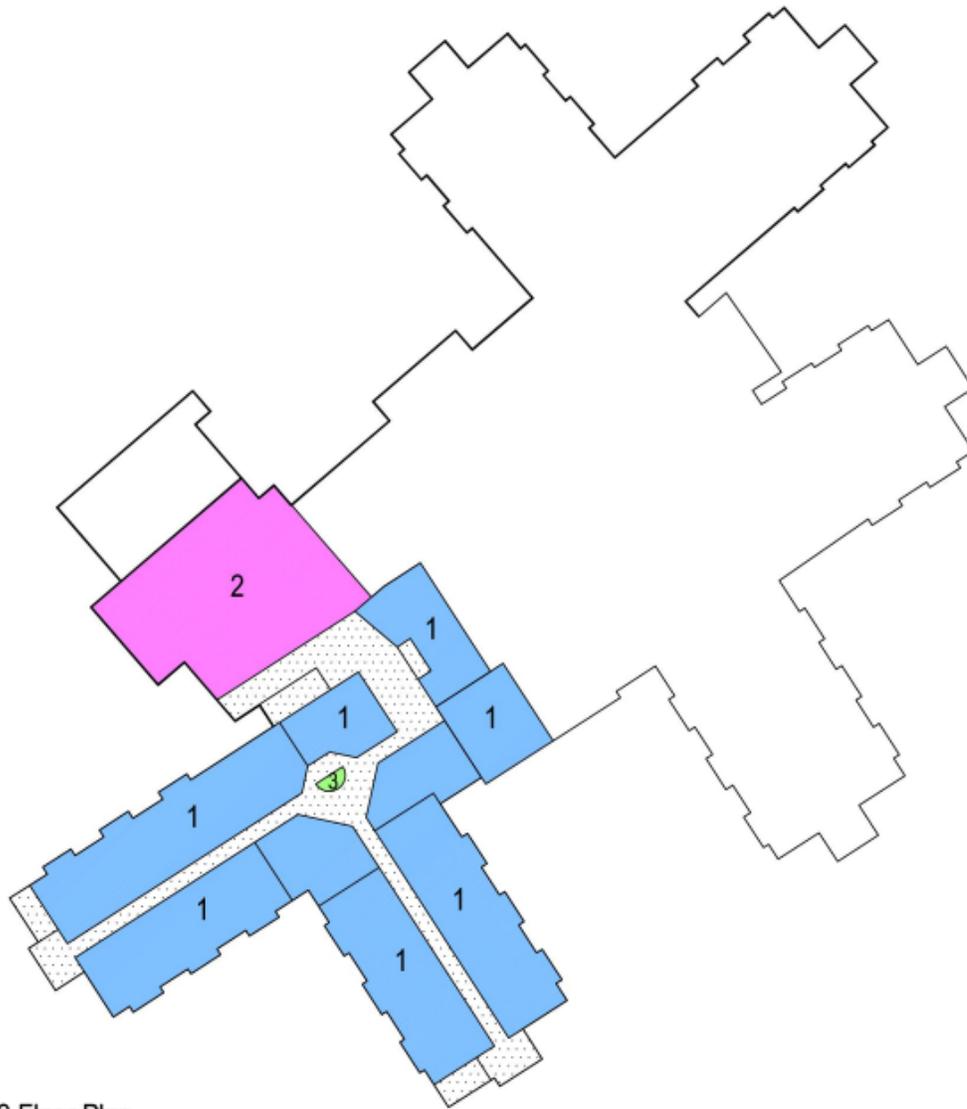


GRAPHIC SCALE

LEGEND

- | | |
|------------------------|----------------------|
| CIRCULATION | ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

3. Delaware Valley Veterans Home
Philadelphia, PA



Level 2 Floor Plan



GRAPHIC SCALE

LEGEND

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 AREAS ON LIVING UNIT 2 BUILDING SERVICE 3 CLINICAL | <ul style="list-style-type: none"> 4 ADMINISTRATION 5 SOCIAL ACTIVITY 6 BUILDING SUPPORT 7 INTERIOR COURTYARD |
|---|---|

FACILITY NAME: Delaware Valley Veterans Home		
Facility #3		
Geographic Location:	Northeastern US	
Number of NHC Beds:	170	
Number of Stories:	2 + Basement	
Building Footprint Area	74,507 sf	
Number of Parking Spaces:	120	
Acreage⁽²⁾:	16.7 acres	
SF of Facility ⁽¹⁾:	110,148 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	30-50 beds per unit; central nurses station	X
Storage	Sufficient assigned storage for facility and residents	O/N
Flexible Plan	Yes	X
Type of Dining	Centralized and On-unit	O/N
Social Activity	Multipurpose room on main level, outdoor courtyard, chapel	F
Resident Support Areas	Laundry on each floor	N
Bathing Options	In room bathing and congregate	O/N
Resident Rooms	Mainly 2 bed rooms with two single rooms per unit for special care residents	X
Loop Service Road	Yes	X
Mechanical Room	Located on second floor	F
Receiving Areas	Screened from Main Entrance	F
N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit		

NOTE:

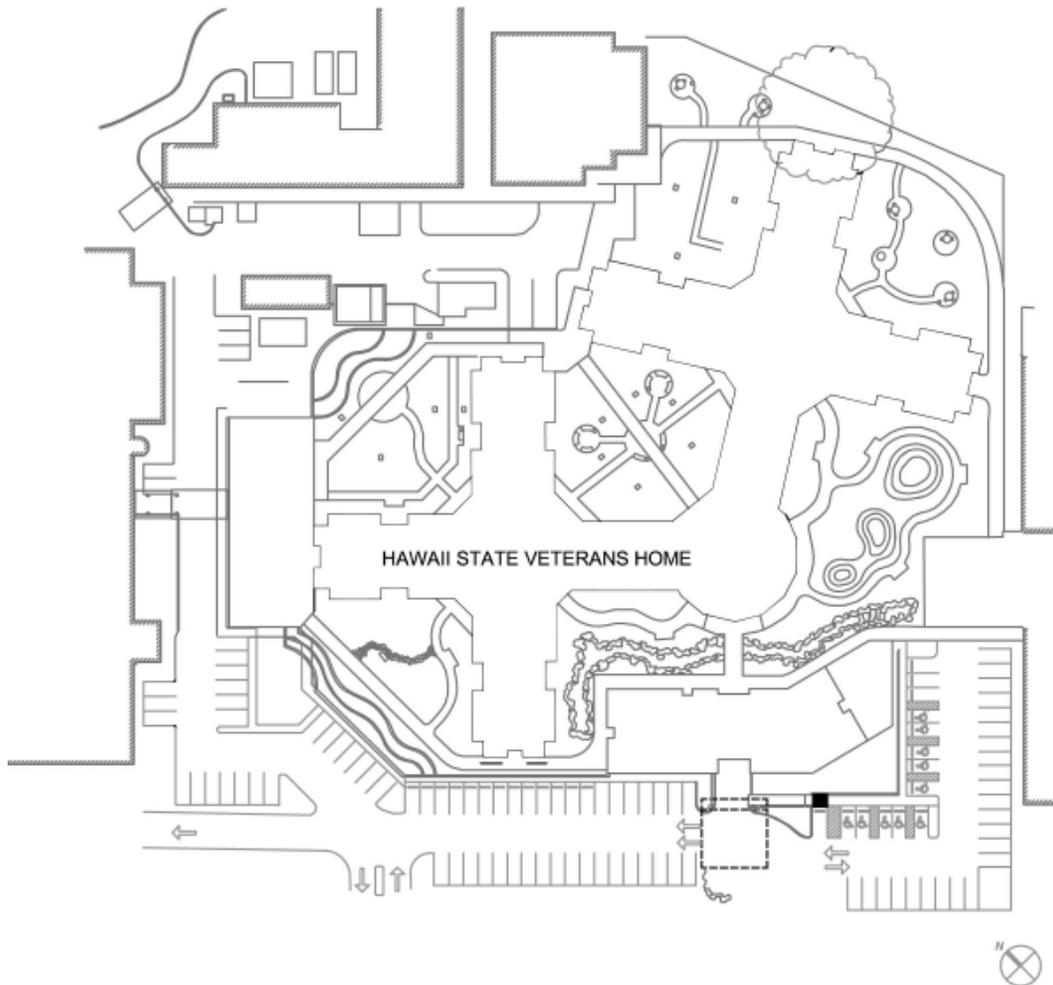
- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

4. Hawaii State Veterans Home

Hilo, HI

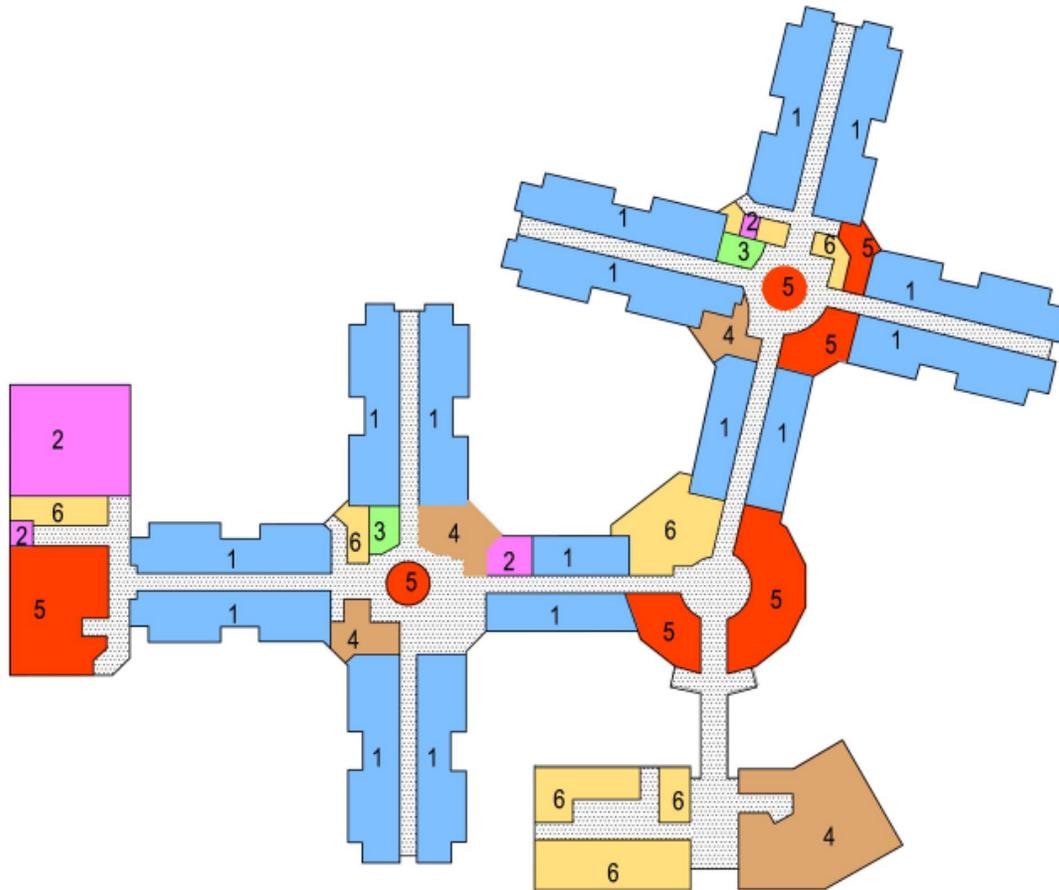
Architect: Architects Hawaii LTD.

Acreage: 5.5 acres
Stories: 1
Geographic Location: Hawaii
No. of Beds: 119
Square Footage: 59,000 sq. ft.



Site Plan
NTS

4. Hawaii State Veterans Home
Hilo, Hawaii



Ground Floor Plan

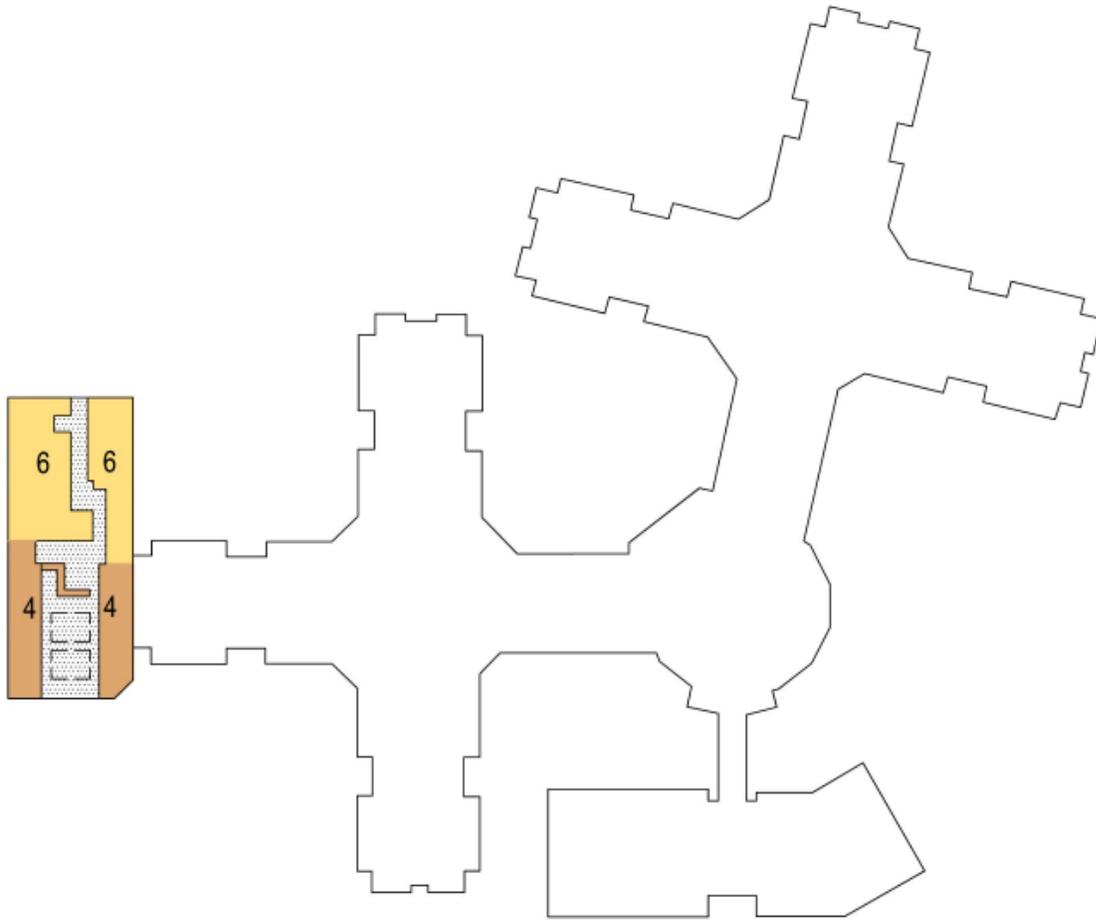


GRAPHIC SCALE

LEGEND

- | | |
|--|---|
|  CIRCULATION | 4  ADMINISTRATION |
| 1  AREAS ON LIVING UNIT | 5  SOCIAL ACTIVITY |
| 2  BUILDING SERVICE | 6  BUILDING SUPPORT |
| 3  CLINICAL | 7  INTERIOR COURTYARD |

4. Hawaii State Veterans Home
Hilo, Hawaii



Second Floor Plan



GRAPHIC SCALE

LEGEND

- | | | | |
|--|------------------------|--|----------------------|
| | CIRCULATION | | 4 ADMINISTRATION |
| | 1 AREAS ON LIVING UNIT | | 5 SOCIAL ACTIVITY |
| | 2 BUILDING SERVICE | | 6 BUILDING SUPPORT |
| | 3 CLINICAL | | 7 INTERIOR COURTYARD |

FACILITY NAME: Hawaii State Veterans Home		
Facility #4		
Geographic Location:	Hawaii USA	
Number of NHC Beds:	119	
Number of Stories:	1	
Building Footprint Area	59,000	
Number of Parking Spaces:	106 (94 standard, 12 wheelchair accessible)	
Acreage ⁽²⁾ :	5.5 acres	
SF of Facility ⁽¹⁾ :	59000 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	2 - 48 Bed Units	X
Storage	Resident storage in Building B; private closets in patient room	O/N
Flexible Plan	Yes	X
Type of Dining	Centralized dining (Building D)	
Social Activity	Multi-purpose Room, outdoor courtyards, barber, chapel, family dining area	
Resident Support Areas	Therapy rooms, on-unit resident lounge, centralized "living room", quiet room	
Bathing Options	Patient rooms and on-unit tubrooms	
Resident Rooms	Primarily 2 bed room with 16 singles and 7 isolation rooms total	X
Loop Service Road	Yes	X
Mechanical Room	Located in separate building	
Receiving Areas	Opposite of Main Entrance	

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

5. New York State Veterans Home

Montrose, NY

Architect: Perkins Eastman Architects, P.C.

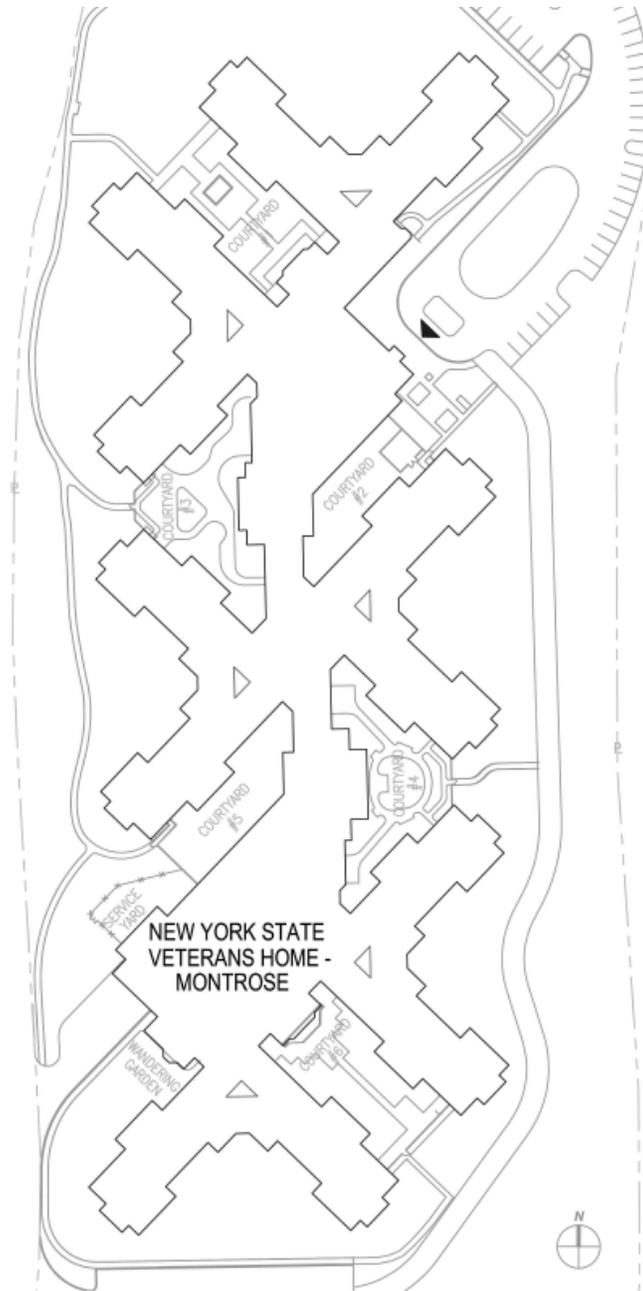
Acreage: 22.6

Stories: 1

Geographic Location: Northeastern U.S.A.

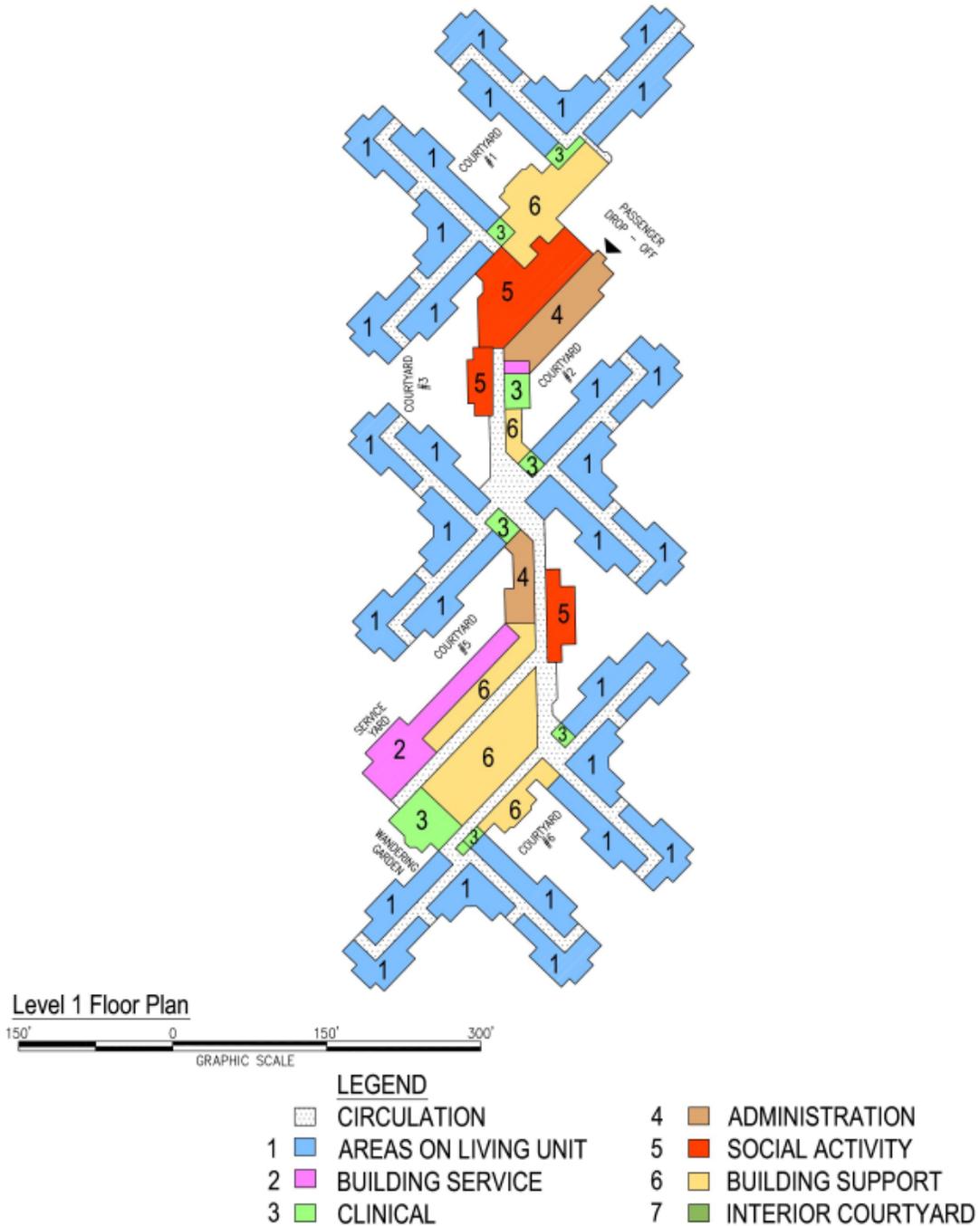
No. of Beds: 252

Square Footage: 158,094 sq. ft.



Site Plan
NTS

5. New York State Veterans Home
 Montrose, NY



FACILITY NAME: <i>New York State Veterans Home (Montrose)</i>	
Facility #5	
Geographic Location:	North Eastern US
Number of NHC Beds:	252 Beds
Number of Stories:	1+ Attic
Building Footprint Area	158,094 sf
Number of Parking Spaces:	304 spaces plus 8 wheelchair accessible
Acreage ⁽²⁾ :	22.6 acres
SF of Facility ⁽¹⁾ :	158,094 gs

FACILITY FEATURE ANALYSIS

Feature/Use	Description	Proximity to Unit
Nursing Unit Size	42 Bed Nursing Unit	X
Storage	Sufficient Storage on and off-unit	O/N
Flexible Plan	Yes	X
Type of Dining	On-Unit Dining with Centralized Kitchen	O
Social Activity	Billiards Room, Barber/Beauty Shop, Exterior Vestibules, Crafts Area, Meditation Room	O/N
Resident Support Areas	Laundry on-unit, Quiet Dining, Physical Therapy, Activity Areas, Dementia Day Room	O/N
Bathing Options	Congregate On-Unit Bathing	X
Resident Rooms	Mainly 2 Bed Rooms with a shared Toilet Room, with 5 singles per unit	X
Loop Service Road	Yes	X
Mechanical Room	Service Branch of Facility	F
Receiving Areas	Screened from Main Entrance	X

N - Near to Nursing Care Unit **O** - On Unit **F** - Far from Nursing Care Unit

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

6. Oklahoma Veterans Center

Lawton, OK

Architect: The Benham Group/HWA

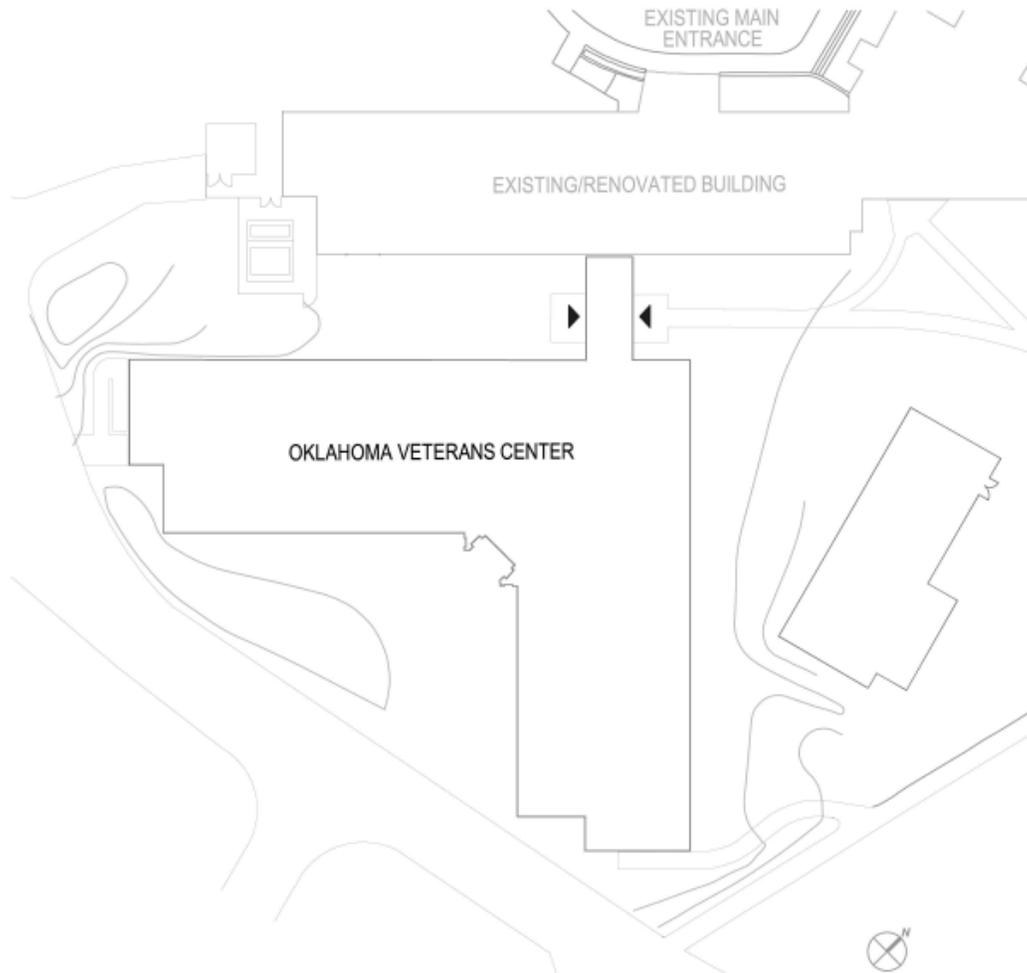
Acreage: 2.57

Stories: 2

Geographic Location: Central U.S.A.

No. of Beds: 50

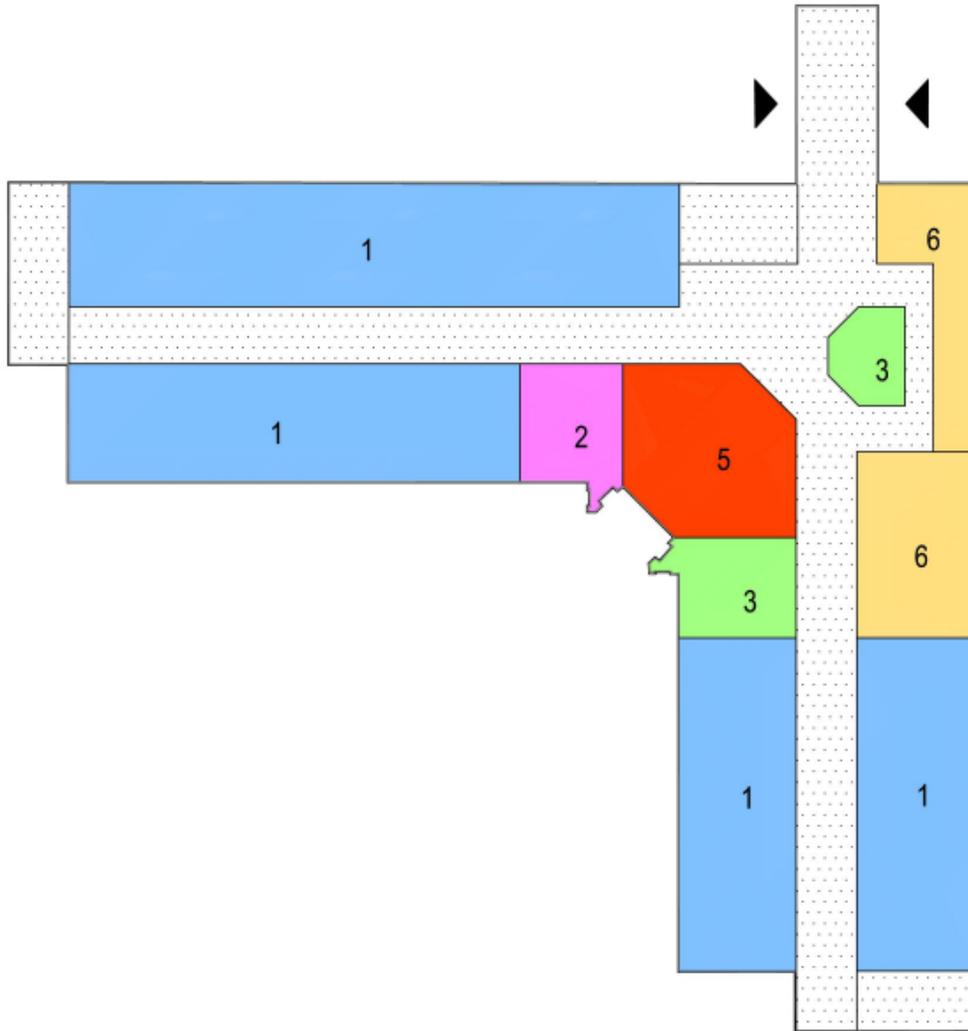
Square Footage: 26,295 sq. ft.



Site Plan

NTS

6. Oklahoma Veterans Center
Lawton, OK



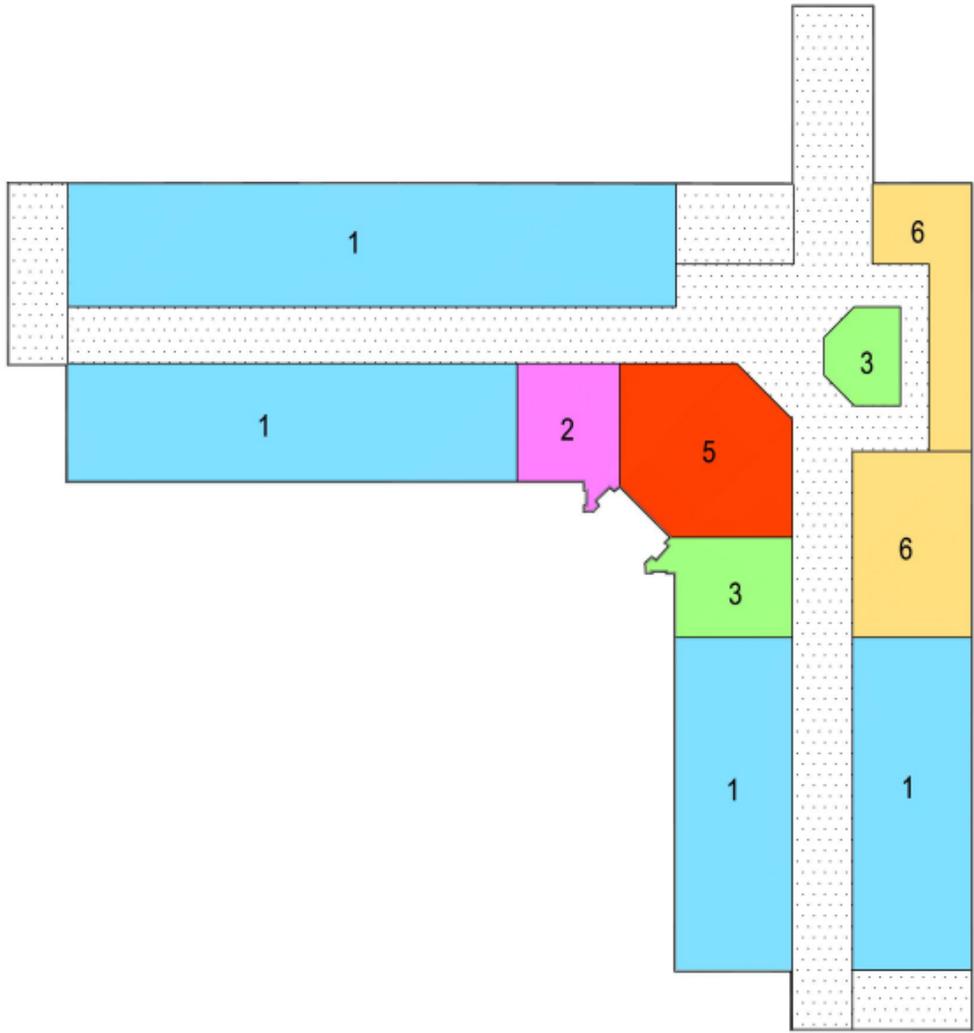
Level 1 Floor Plan



LEGEND

- | | |
|-------------------------|-----------------------|
| CIRCULATION | 4 ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

6. Oklahoma Veterans Center
Lawton, OK



Level 2 Floor Plan



LEGEND	
	CIRCULATION
1	AREAS ON LIVING UNIT
2	BUILDING SERVICE
3	CLINICAL
4	ADMINISTRATION
5	SOCIAL ACTIVITY
6	BUILDING SUPPORT
7	INTERIOR COURTYARD

FACILITY NAME: Oklahoma Veterans Center		
Facility #6		
Geographic Location:	Central US	
Number of NHC Beds:	50	
Number of Stories:	4 + Basement	
Building Footprint Area	13,362 gsf (new)	
Number of Parking Spaces:	N/A	
Acreage ⁽²⁾ :	2.57 acres	
SF of Facility ⁽¹⁾ :	26,295 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	30 Bed Unit (new)	X
Storage	Sufficient assigned storage areas	O
Flexible Plan	Yes	X
Type of Dining	Centralized Dining	N
Social Activity	Smoking Lounge, Multi-Purpose Room, Outdoor Patio and Smoking areas	F
Resident Support Areas	On-Unit Exam Rooms, Conference room (renov.)	O
Bathing Options	Congregate Bathing on each unit	O
Resident Rooms	Primarily 2 bed rooms, consisting of a shared lavatory and toilet. 3 Single Bed rooms per unit.	X
Loop Service Road	N/A	X
Mechanical Room	Small Mechanical room on each unit, with gravel mechanical yard on-site.	O
Receiving Areas	N/A	X

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

7. Delaware Veterans Home

Milford, DE

Architect: GBQC Architects/Becker Morgan Group

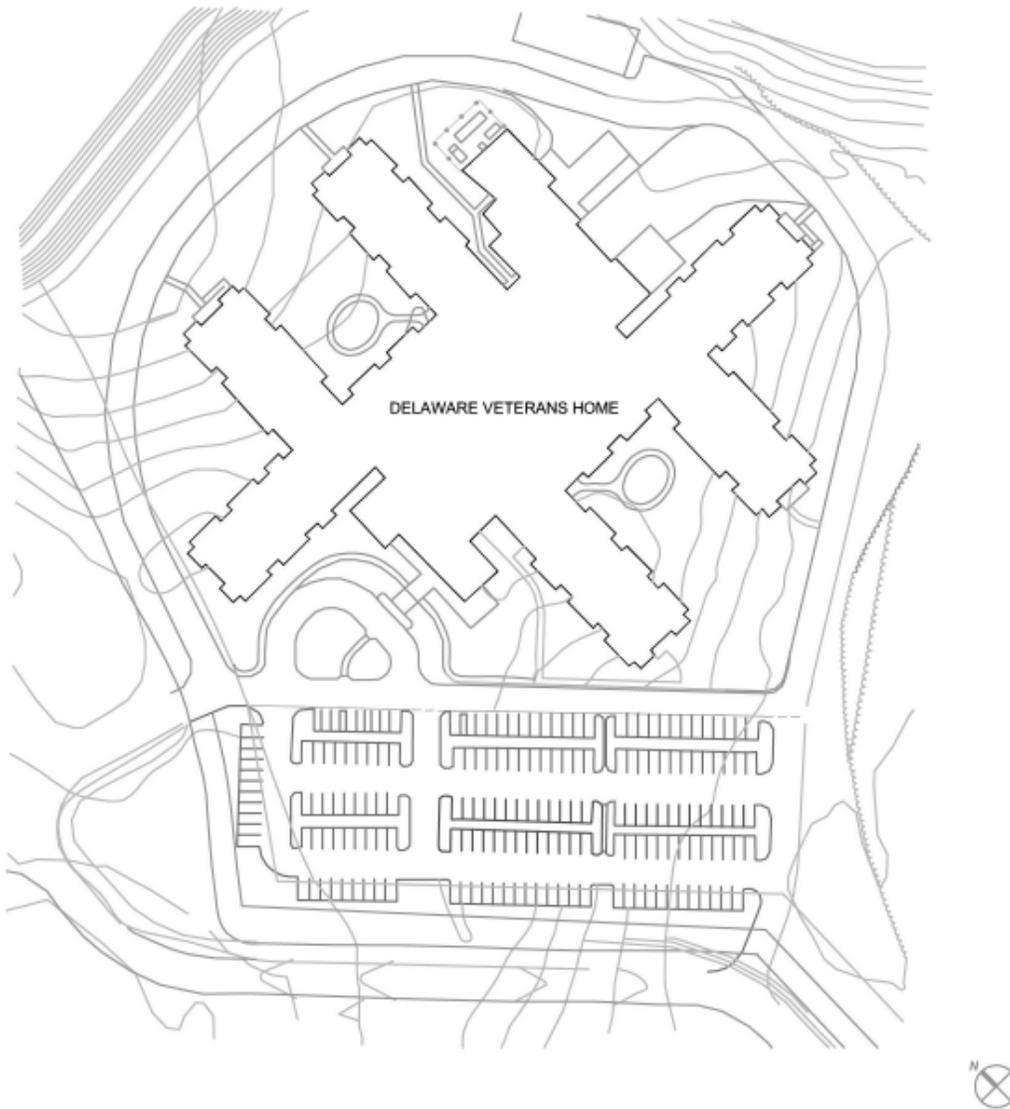
Acreage: 22.9

Stories: 1

Geographic Location: Mid Atlantic U.S.A.

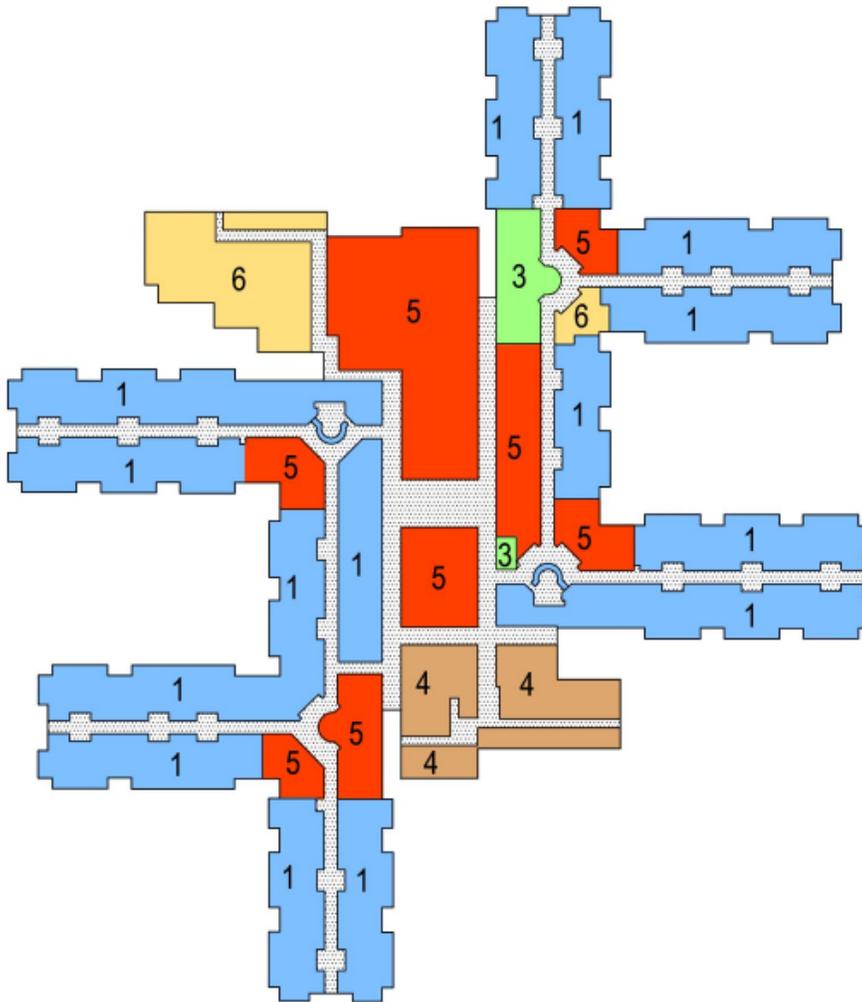
No. of Beds: 144

Square Footage: 107,687 sq. ft.



Site Plan
NTS

7. Delaware Veterans Home
Milford, DE



Floor Plan



GRAPHIC SCALE

LEGEND	
	CIRCULATION
1 	AREAS ON LIVING UNIT
2 	BUILDING SERVICE
3 	CLINICAL
4 	ADMINISTRATION
5 	SOCIAL ACTIVITY
6 	BUILDING SUPPORT
7 	INTERIOR COURTYARD

FACILITY NAME: Delaware Veterans Home		
Facility #7		
Geographic Location:	Northeastern USA (Delaware)	
Number of NHC Beds:	144	
Number of Stories:	1	
Building Footprint Area	107,687 sf	
Number of Parking Spaces:	174 standard; 8 wheelchair accessible	
Acreage (2) :	22.9 acres	
SF of Facility (1) :	107,687 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	2 - 40 bed Nursing Units, 2 - 32 bed Dementia Units and 1 - 32 bed Domicilliary Unit	X
Storage	Sufficient storage	O/N
Flexible Plan	Yes	X
Type of Dining	Centralized for Nursing units; on unit for Dementia	
Social Activity	Inner courtyards, library, barber/beauty	
Resident Support Areas	Therapy areas, chapel, multipurpose room, lounge	
Bathing Options	Within patient bedroom and on unit	
Resident Rooms	Primarily 2 bed rooms with 4 singles on the nursing unit only	X
Loop Service Road	Yes	X
Mechanical Room	Located near the loading dock	F
Receiving Areas	Opposite of Main entrance	
N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit		

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

8. Washington State Veterans Home

Retsil, WA

Architect: NBBJ

Acreage: 11.6 acres

Stories: 2 + Service tunnel in Basement

Geographic Location: Northwestern U.S.A.

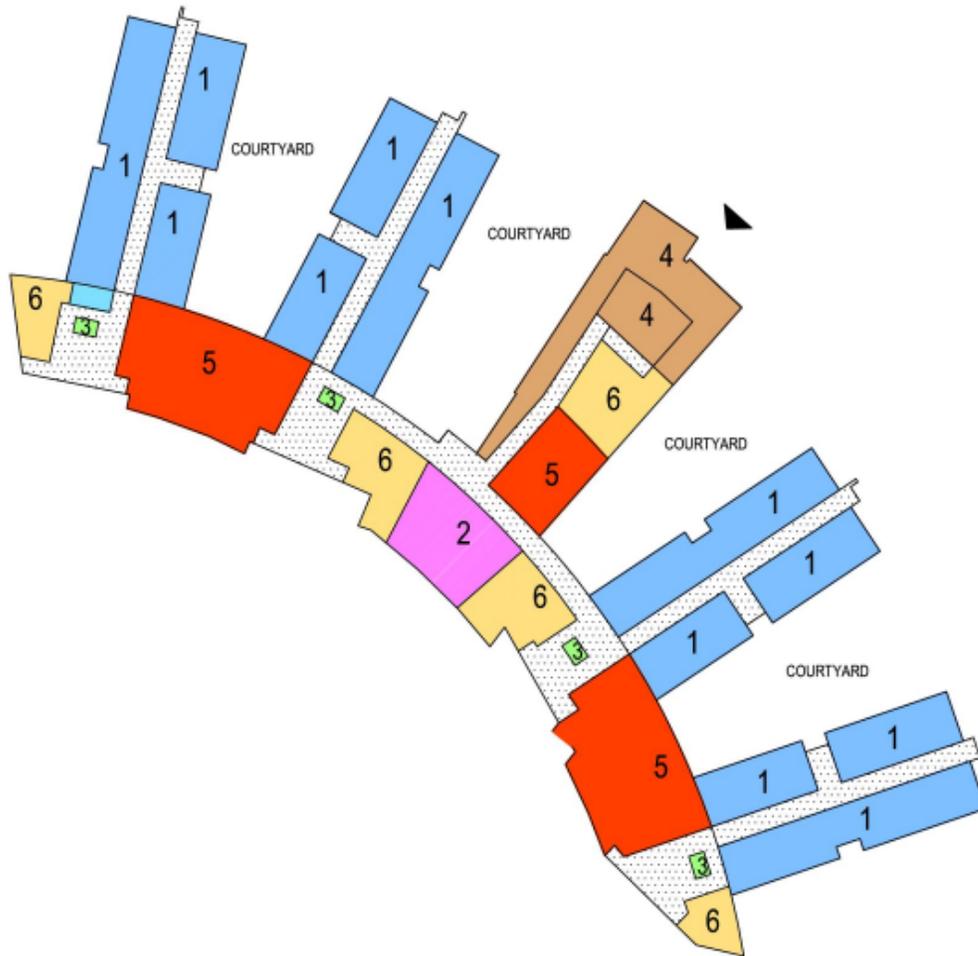
No. of Beds: 240

Square Footage: 175,425 sq. ft.



Site Plan
NTS

8. Washington State Veterans Center
Retsil, WA



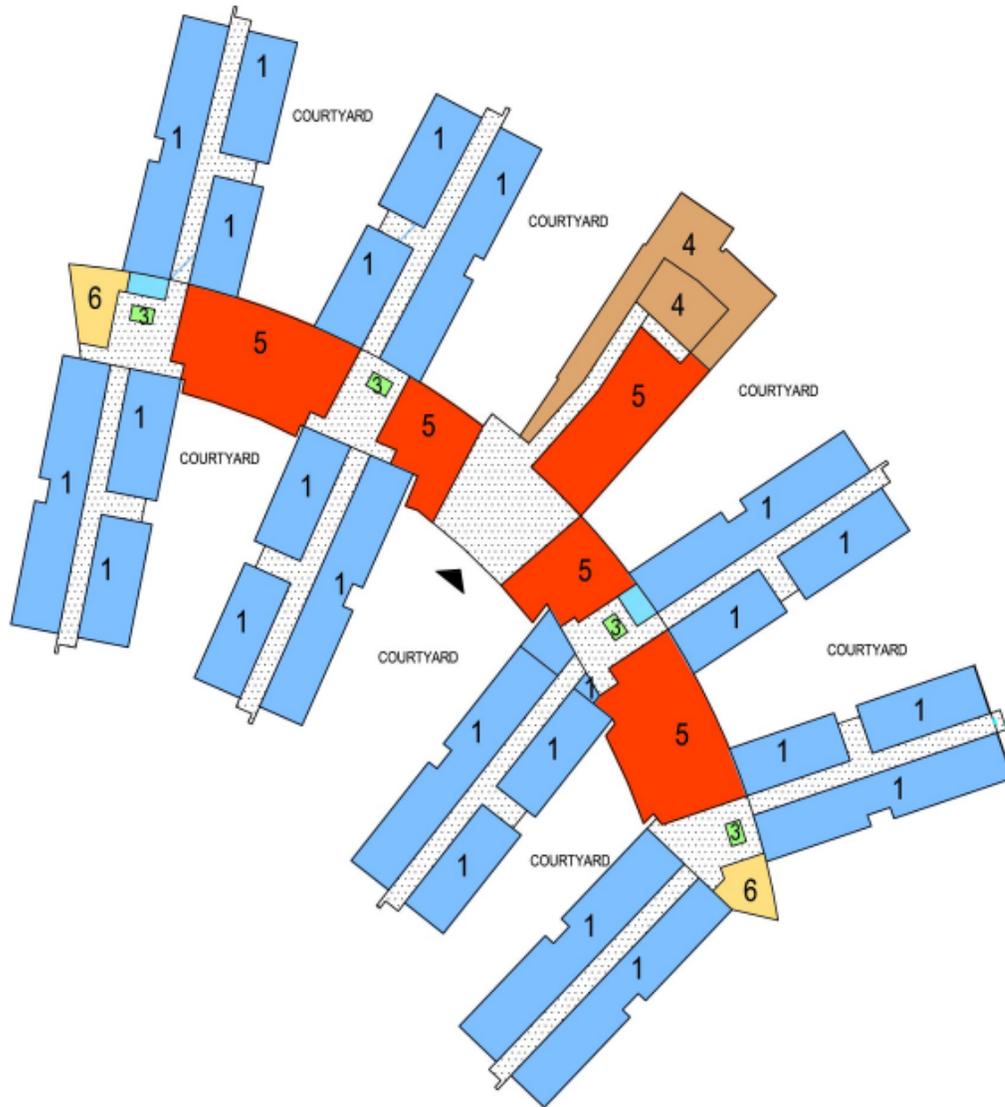
Level 1 Floor Plan



LEGEND

- | | |
|----------------------|--------------------|
| CIRCULATION | ADMINISTRATION |
| AREAS ON LIVING UNIT | SOCIAL ACTIVITY |
| BUILDING SERVICE | BUILDING SUPPORT |
| CLINICAL | INTERIOR COURTYARD |

8. Washington State Veterans Center
Retsil, WA



Level 2 Floor Plan



LEGEND

- | | |
|------------------------|----------------------|
| CIRCULATION | ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

FACILITY NAME: <i>Washington State Veterans Home</i>		
Facility #8		
Geographic Location:	Northwestern US	
Number of NHC Beds:	240	
Number of Stories:	2 + Service tunnel in Basement	
Building Footprint Area	92,257 gsf	
Number of Parking Spaces:	26	
Acreage (2) :	11.6 acres	
SF of Facility (1):	175,425 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	20 bed unit	X
Storage	Yes	F
Flexible Plan	Yes	X
Type of Dining	On-Unit	O
Social Activity	Inner Courtyards, barber shop/salon	F
Resident Support Areas	Therapy areas, Multi-Purpose Rooms for each unit, servery for each unit dining area	O
Bathing Options	none	O
Resident Rooms	Primarily 2 bed rooms, consisting of a shower, lavatory and toilet; 4 singles per unit	X
Loop Service Road	Yes	X
Mechanical Room	In basement	F
Receiving Areas	Screened from Main Entrance	F

N - Near to Nursing Care Unit **O** - On Unit **F** - Far from Nursing Care Unit

NOTE:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

9. Western Kentucky Veterans Center

Madisonville, KY

Architect: Johnson Romanowitz Architects

Acreage: 16.8 acres

Stories: 1

Geographic Location: Southeastern U.S.A.

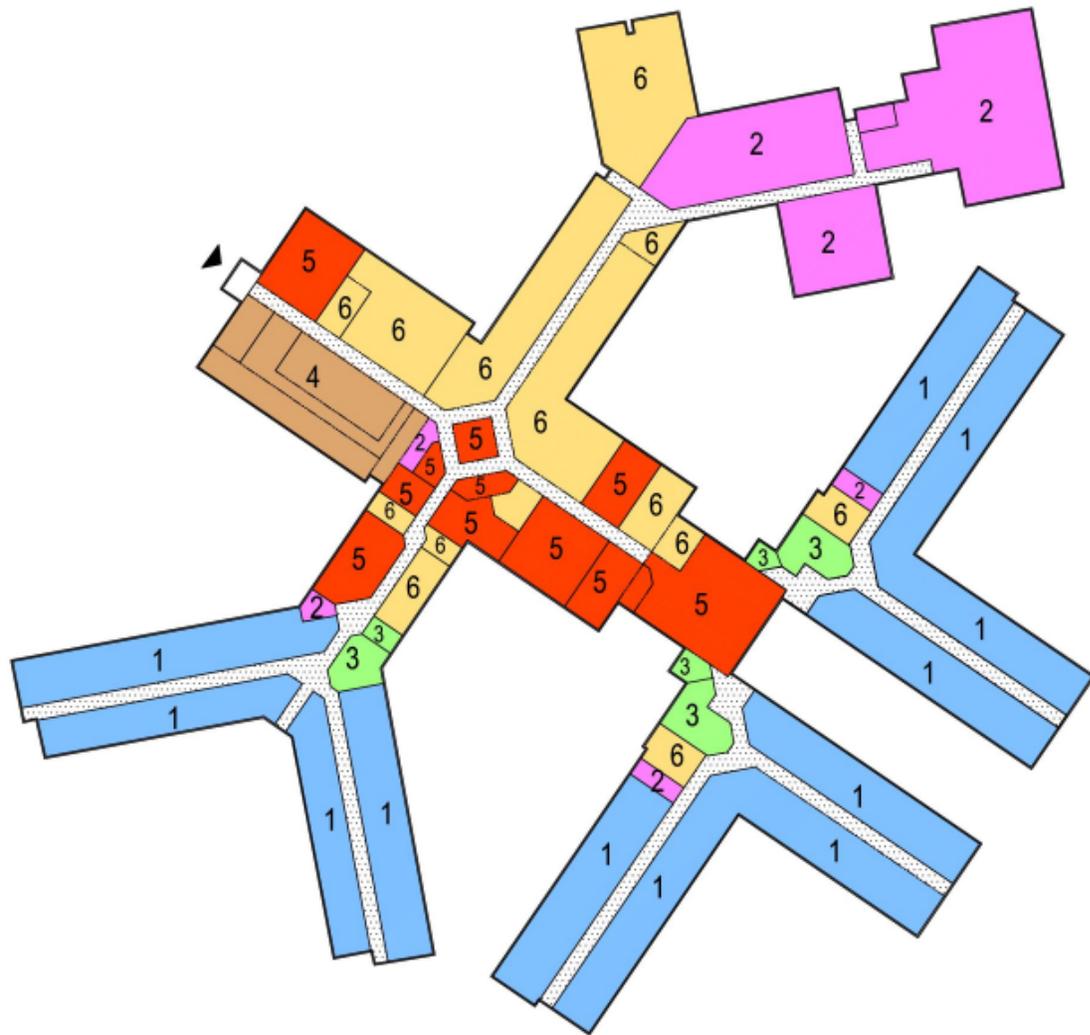
No. of Beds: 120

Square Footage: 82,017 sq. ft.



Site Plan
NTS

9. Western Kentucky Veterans Center
 Madisonville, KY



Level 1 Floor Plan



LEGEND

CIRCULATION	4 ADMINISTRATION
1 AREAS ON LIVING UNIT	5 SOCIAL ACTIVITY
2 BUILDING SERVICE	6 BUILDING SUPPORT
3 CLINICAL	7 INTERIOR COURTYARD

FACILITY NAME: Westerm Kentucky Veterans Center		
Facility #9		
Geographic Location:	Southeastern US	
Number of NHC Beds:	120	
Number of Stories:	1	
Building Footprint Area	82,017 sf	
Number of Parking Spaces:	128	
Acreage (2) :	16.8 acres	
SF of Facility (1) :	82,017 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	3 Nursing Units (30, 45 and 45); Centralized Nurses station	X
Storage	Sufficient assigned storage areas	O
Flexible Plan	Yes	X
Type of Dining	Centralized w/on-unit at special care unit	F
Social Activity	Large Indoor activity room in Area "1"	F
Resident Support Areas	Kitchenette, gift shop, resident lounge	O
Bathing Options	Congregate Bathing on each unit	O
Resident Rooms	Primarily 2 bed rooms, consisting of a shared lavatory and toilet. 30 bed unit is all singles. Each unit have private rooms for special care. Mechanical unit in each room.	X
Loop Service Road	Yes	X
Mechanical Room	Located in each resident room	O
Receiving Areas	In Area "5". 50' service road. Facility contains a body holding room	F

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

Note:

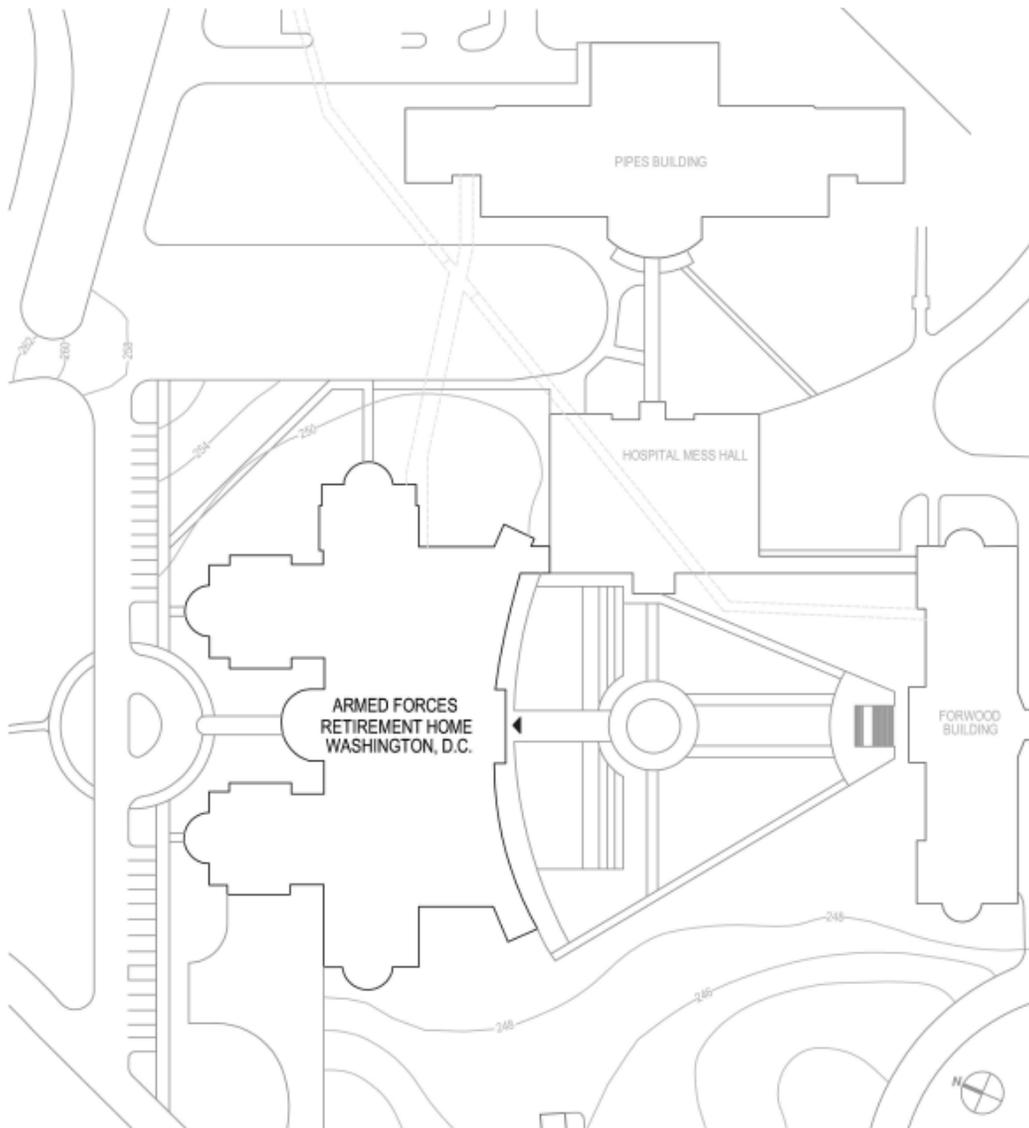
- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

10. Armed Forces Retirement Home

Washington, DC

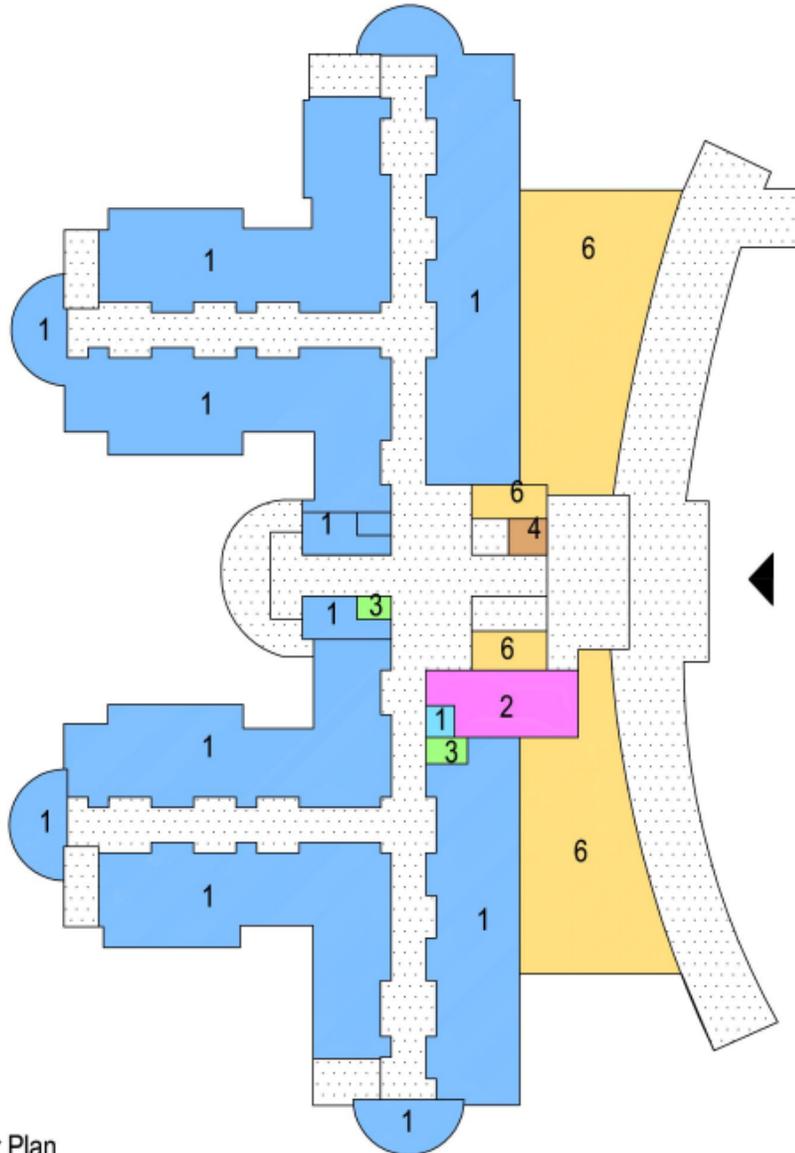
Architect: Smith, Hinchman & Grylls Associates, P.C.

Acreage: 5.16
Stories: 5 + Attic and Basement
Geographic Location: Mid Atlantic U.S.A.
No. of Beds: 200
Square Footage: 233, 520 sq. ft.



Site Plan
NTS

10. Armed Forces Retirement Home
Washington, DC



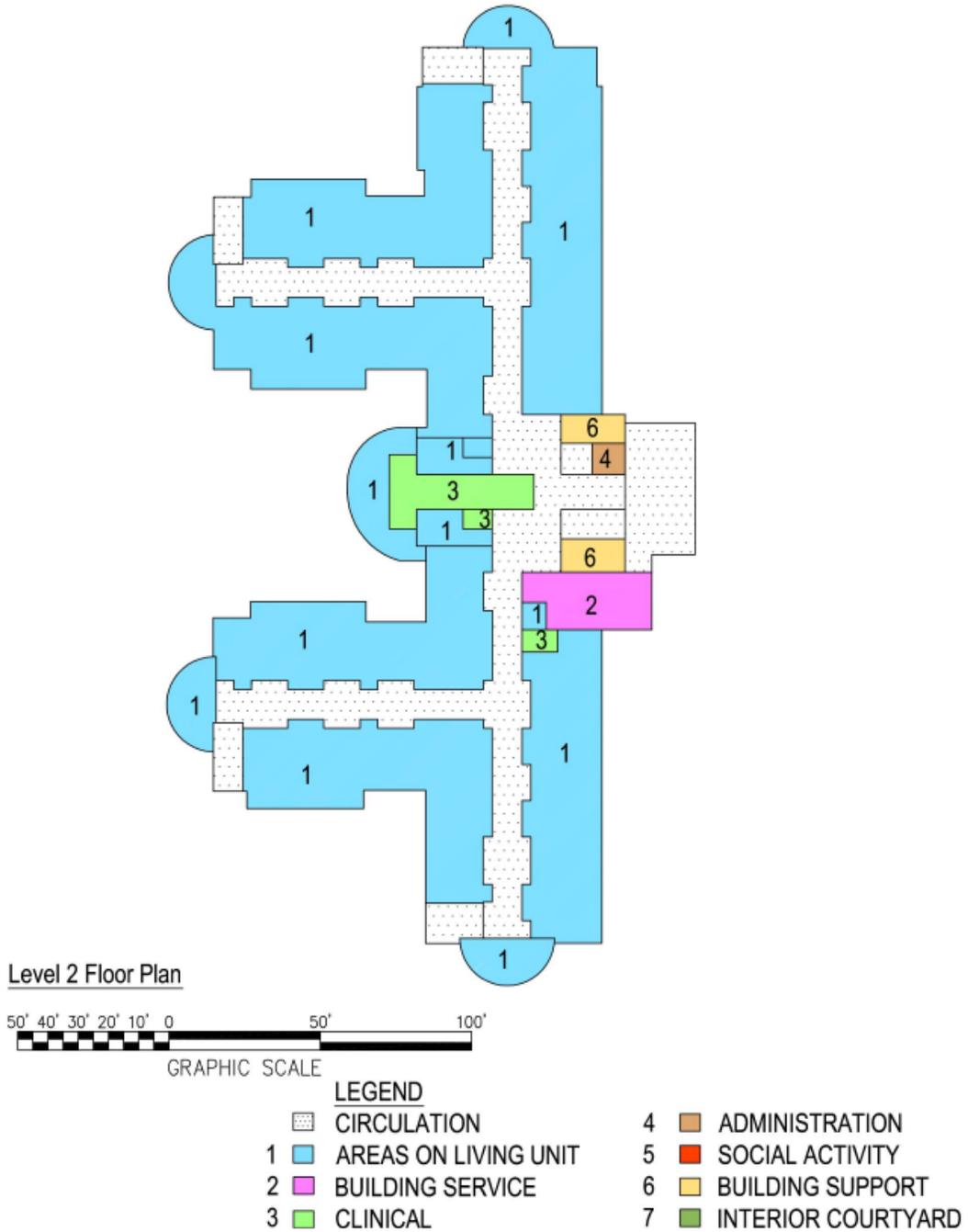
Level 1 Floor Plan



LEGEND

- | | |
|------------------------|----------------------|
| CIRCULATION | 4 ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

10. Armed Forces Retirement Home
Washington, DC



FACILITY NAME: Armed Forces Retirement Home		
Facility #10		
Geographic Location:	Mid-Atlantic US	
Number of NHC Beds:	200	
Number of Stories:	5 + Basement and Attic	
Building Footprint Area	40,800	
Number of Parking Spaces:	26	
Acreage (2) :	5.16 acres	
SF of Facility (1) :	233,520 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	24 bed unit with 2 units per floor	X
Storage	Insufficient assigned storage areas	O
Flexible Plan	No	X
Type of Dining	Centralized	F
Social Activity	Activity room, Sunken Courtyard, Outdoor courtyard, Main Steet	F
Resident Support Areas	Resident laundry room for each floor, Library, therapy	O
Bathing Options	In resident room or congregate bathing room	O
Resident Rooms	Primarily 2 bed rooms, consisting of a shower, lavatory and toilet	X
Loop Service Road	Yes	X
Mechanical Room	In basement	F
Receiving Areas	Screened from Main Entrance	F

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

NOTE:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

11. New York State Veterans' Home Oxford

Oxford, NY

Architects: Kideney Architects

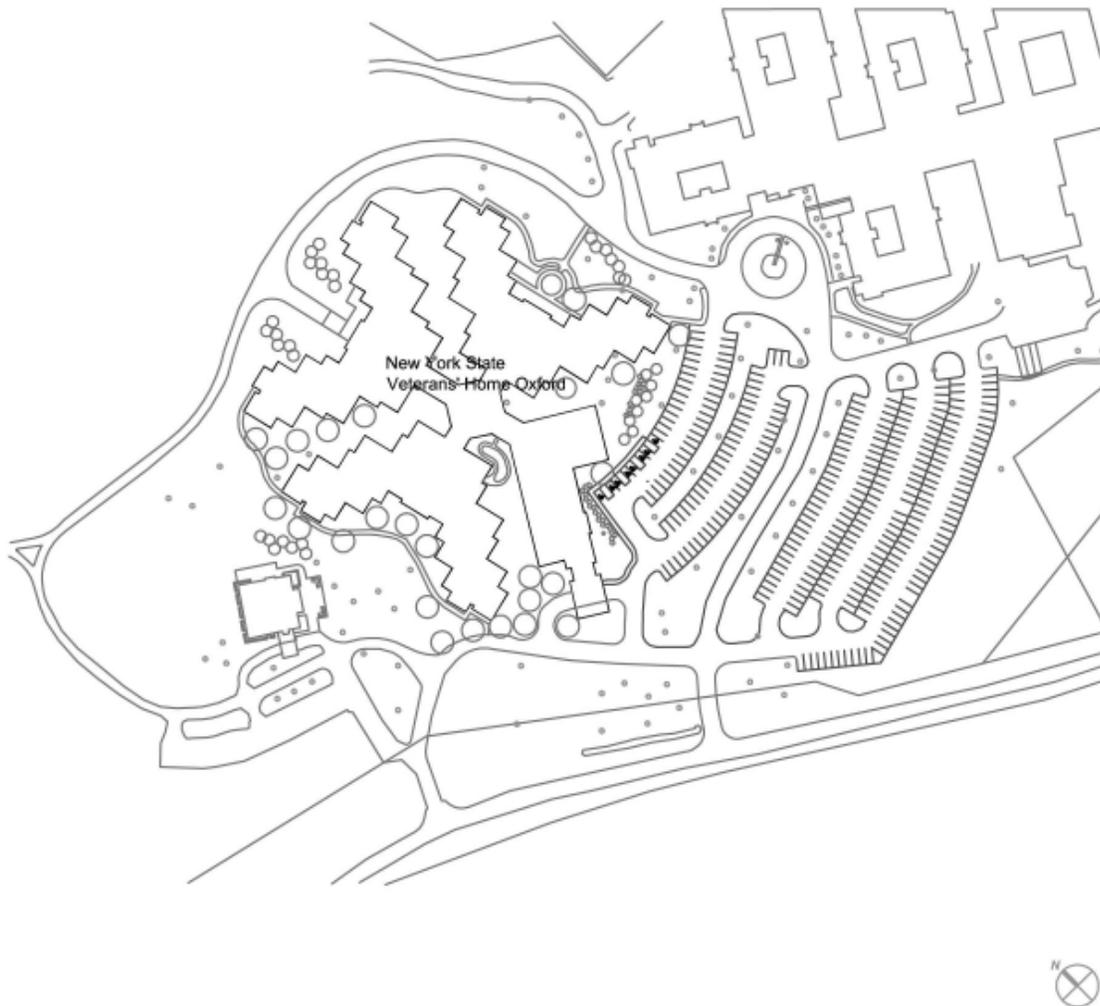
Acreage: 6.9 acres

Stories: 2+ Basement and Mezzanine

Geographic Location: Northeastern U.S.A.

No. of Beds: 242

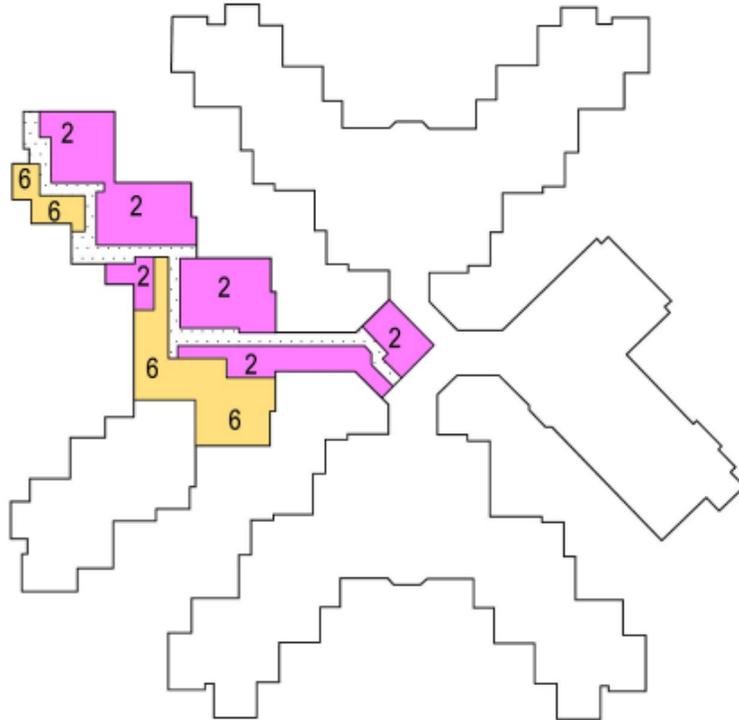
Square Footage: 214,235 sq. ft.



Site Plan

NTS

11. New York State Veterans' Home Oxford
 Oxford, NY



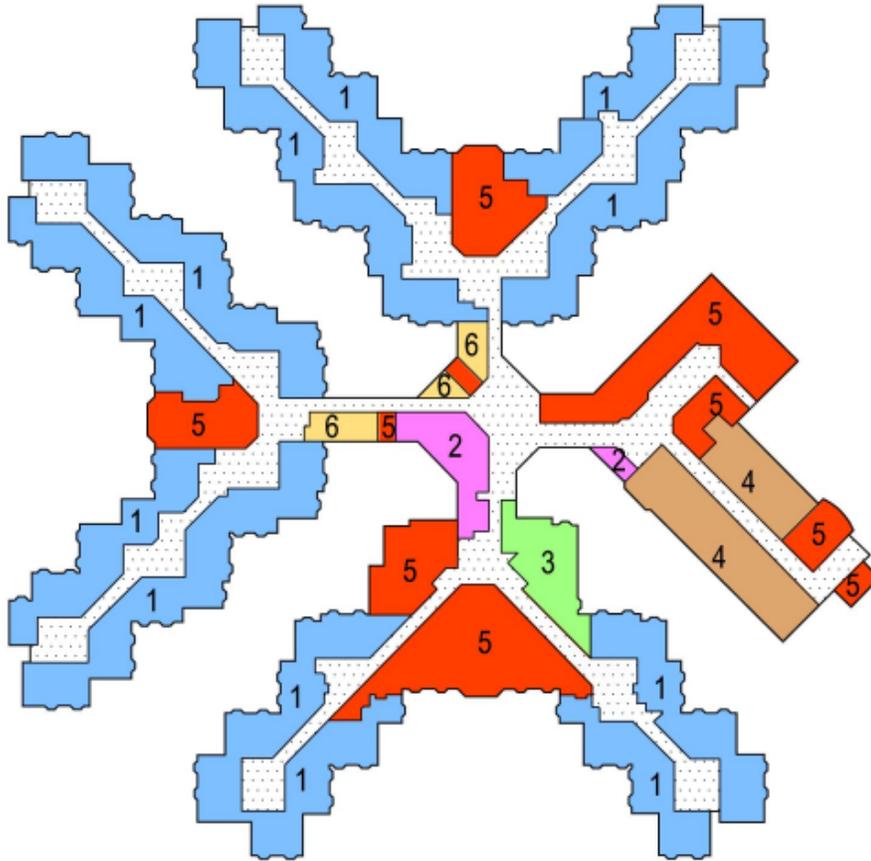
Basement Plan



LEGEND

- | | | | |
|---|----------------------|---|--------------------|
| 1 | AREAS ON LIVING UNIT | 4 | ADMINISTRATION |
| 2 | BUILDING SERVICE | 5 | SOCIAL ACTIVITY |
| 3 | CLINICAL | 6 | BUILDING SUPPORT |
| | | 7 | INTERIOR COURTYARD |

11. New York State Veterans' Home Oxford
Oxford, NY



First Floor Plan

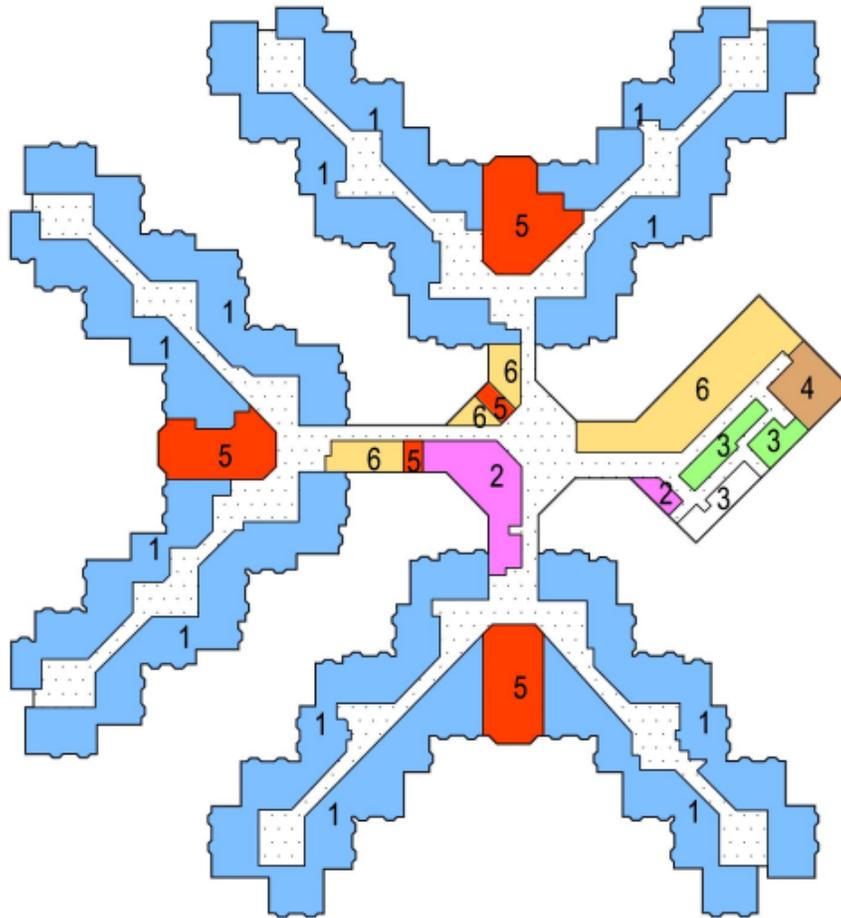


GRAPHIC SCALE

LEGEND

- | | | | | |
|---|--|---|--|--------------------|
|  | CIRCULATION | 4 |  | ADMINISTRATION |
| 1 |  AREAS ON LIVING UNIT | 5 |  | SOCIAL ACTIVITY |
| 2 |  BUILDING SERVICE | 6 |  | BUILDING SUPPORT |
| 3 |  CLINICAL | 7 |  | INTERIOR COURTYARD |

11. New York State Veterans' Home Oxford
 Oxford, NY



Second Floor Plan



LEGEND

- | | |
|-------------------------|-----------------------|
| CIRCULATION | 4 ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

FACILITY NAME: New York State Veterans Home (Oxford)		
Facility #11		
Geographic Location:	Northeastern USA (New York)	
Number of NHC Beds:	242	
Number of Stories:	2 + Basement and Mezzanine	
Building Footprint Area	99,770 sf	
Number of Parking Spaces:	342 standard; 8 wheelchair accessible	
Acreage:	6.9 acres	
SF of Facility:	214,235 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	5 - 40 Bed units (Typical) and 1 - 32 Bed unit (Dementia)	X
Storage	Sufficient storage	
Flexible Plan	Yes	X
Type of Dining	On unit	
Social Activity	Barber/beauty, gift shop, multi-purpose room, library, chapel	
Resident Support Areas	Activity room, screened porch, Occupational and Physical Therapy, clinics, dental	
Bathing Options	Within patient bedroom and on -unit tubroom	
Resident Rooms	Primarily 1 bedrooms with 10 - 2 bedroom	X
Loop Service Road	Yes	X
Mechanical Room	In the basement	
Receiving Areas	Opposite from Main entrance and accessible through the basement	
N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit		

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

12. Adult Care Facility at Veterans Home

Rocky Hill, CT

Architects: Moser Pilon Nelson Architects

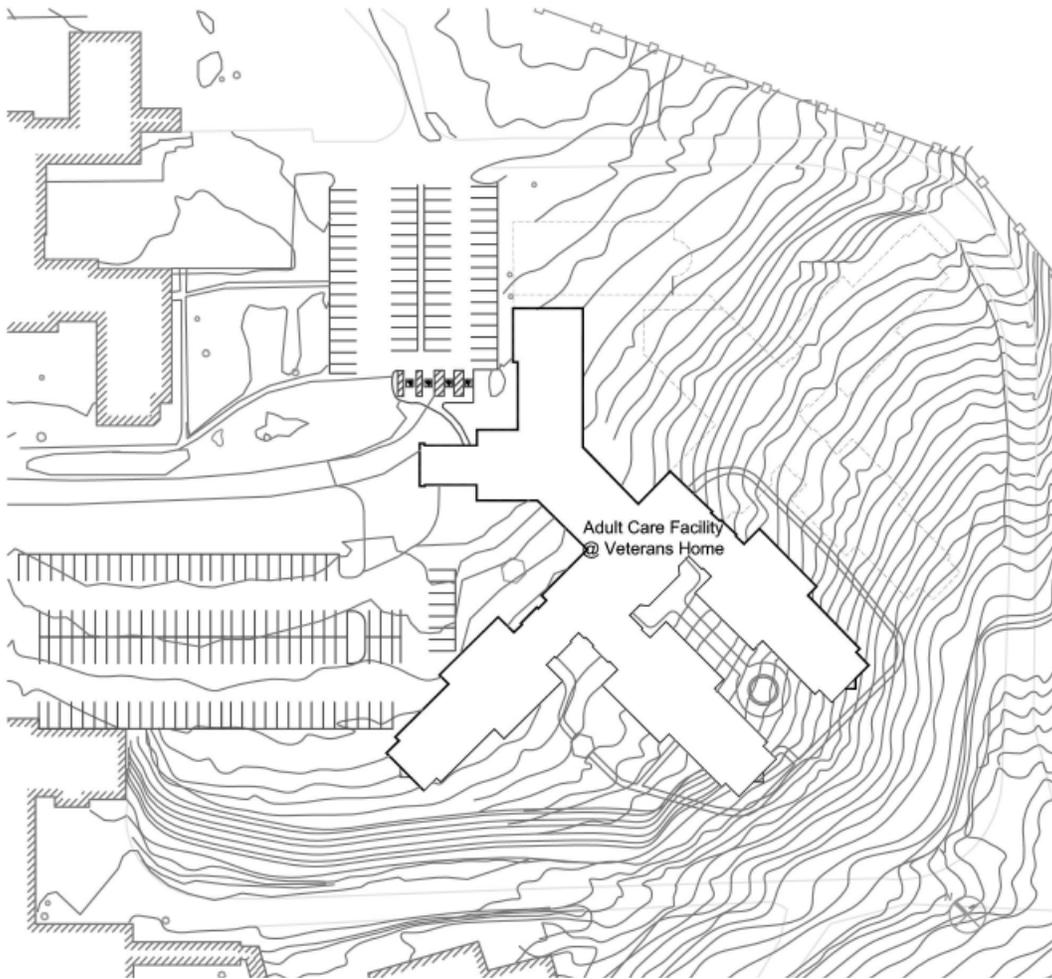
Acreage: 10.9 acres

Stories: 2

Geographic Location: Northeastern U.S.A.

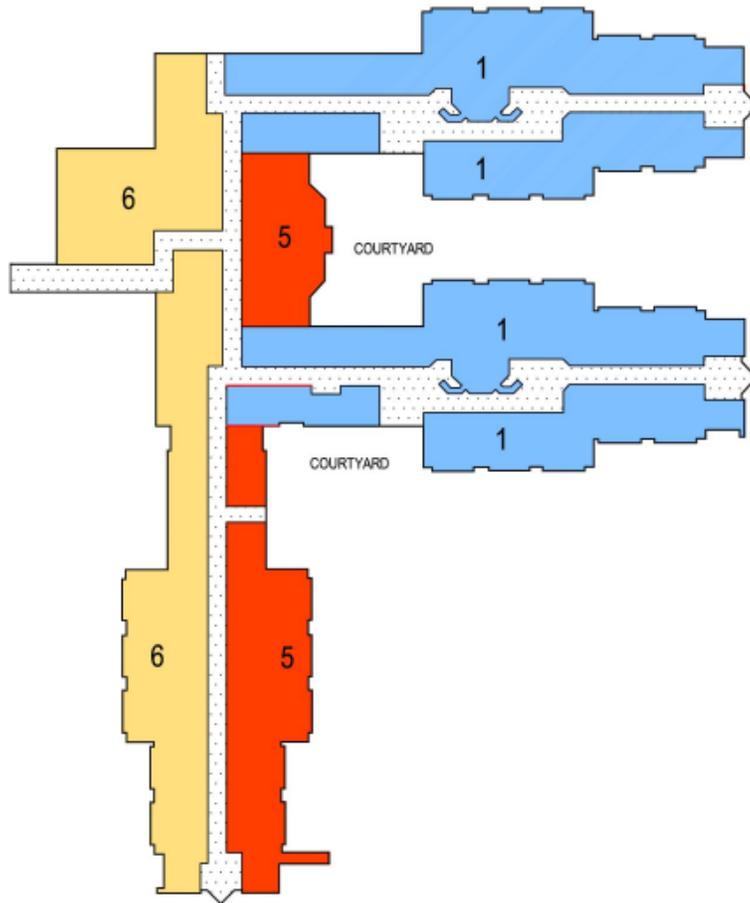
No. of Beds: 125

Square Footage: 39,707 sq. ft.



Site Plan
NTS

12. Adult Care Facility at Veterans Home
Rocky Hill, CT



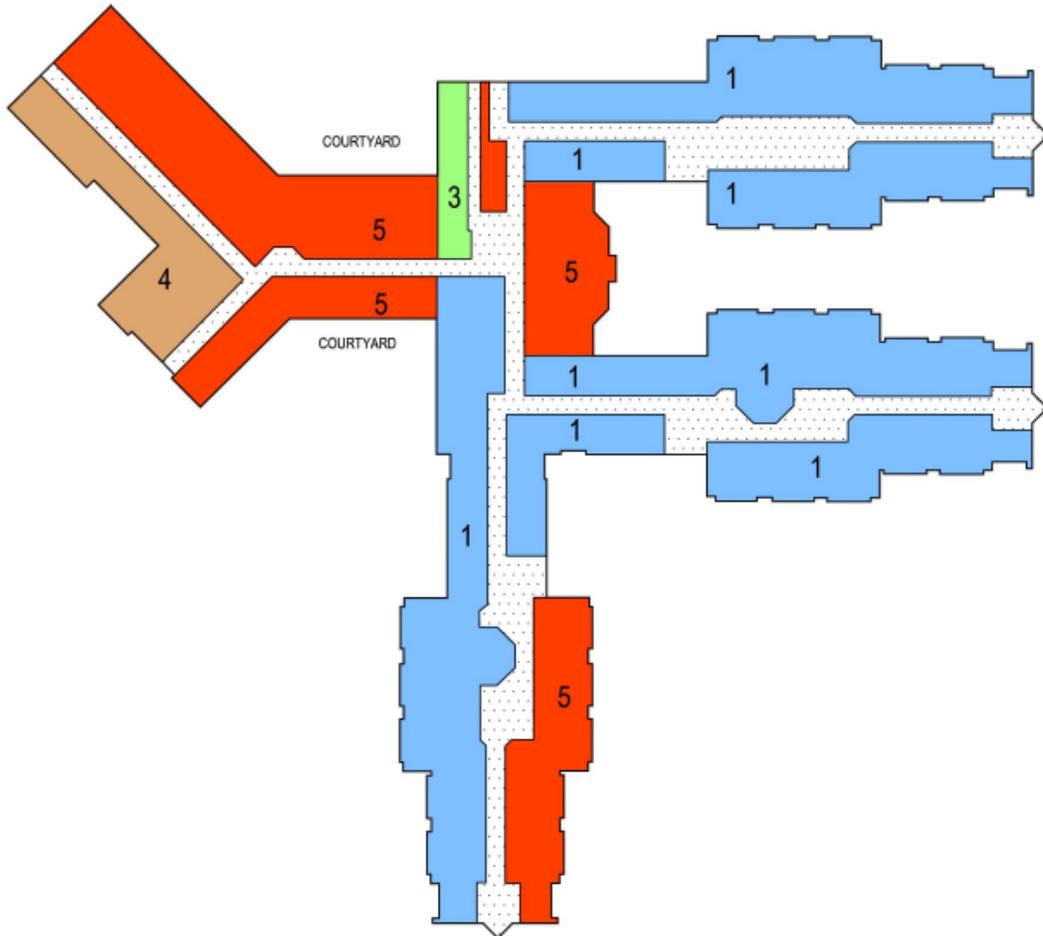
Lower Level Floor Plan



LEGEND

- | | | | |
|---|----------------------|---|--------------------|
|  | CIRCULATION |  | ADMINISTRATION |
|  | AREAS ON LIVING UNIT |  | SOCIAL ACTIVITY |
|  | BUILDING SERVICE |  | BUILDING SUPPORT |
|  | CLINICAL |  | INTERIOR COURTYARD |

12. Adult Care Facility at Veterans Home
Rocky Hill, CT



Level 1 Floor Plan



LEGEND

- | | |
|-------------------------|-----------------------|
| CIRCULATION | 4 ADMINISTRATION |
| 1 AREAS ON LIVING UNIT | 5 SOCIAL ACTIVITY |
| 2 BUILDING SERVICE | 6 BUILDING SUPPORT |
| 3 CLINICAL | 7 INTERIOR COURTYARD |

FACILITY NAME: Adult Care Facility at Veterans Home (Rocky Hill)		
Facility #12		
Geographic Location:	Northeastern USA (Connecticut)	
Number of NHC Beds:	125	
Number of Stories:	2	
Building Footprint Area	23,840 sf	
Number of Parking Spaces:	156 spaces	
Acreage:	10.9 acres	
SF of Facility:	39,707 gsf	
FACILITY FEATURE ANALYSIS		
Feature/Use	Description	Proximity to Unit
Nursing Unit Size	5 25 Bed Nursing Units	X
Storage	Sufficient storage area	
Flexible Plan	Yes	X
Type of Dining	Dining area on each floor	
Social Activity	Recreation room, Gazebo, library, barber/beauty, chapel, canteen, conference rooms, inner courtyard	
Resident Support Areas	Physical Therapy, Occupational Therapy, lounge, deck, pharmacy	
Bathing Options	Within patient bedroom and on-unit tubrooms	
Resident Rooms	Primarily 2 bed rooms with 5 singles per unit	X
Loop Service Road	Yes	X
Mechanical Room	On lower level near the receiving area	
Receiving Areas	Separate service entrance provided	

N - Near to Nursing Care Unit O - On Unit F - Far from Nursing Care Unit

Note:

- 1 All squarefootages are approximate measurements taken from available drawings of the facility.
- 2 Shared site acreage is approximated based upon the building and parking relevant to the respective facility analyzed.

**CHAPTER 106: VETERANS HEALTH ADMINISTRATION – NURSING HOME /
RESIDENTIAL CARE FACILITIES**

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9. Functional Diagram 2	106-16

1 PURPOSE AND SCOPE

- A. This document outlines Space Planning Criteria for Chapter 106: Nursing Home Residential Care Facilities (formerly Nursing Home Care Units) in VA healthcare facilities. These criteria apply to all renovation, modernization and new construction projects.
- B. Nursing Home / Residential Care Facilities provide specialized preventative, therapeutic, and rehabilitative care for residents with long term illnesses in a home-like environment. Facilities can also provide care for short stay services such as skilled nursing and rehabilitation. Clinical and diagnostic services are provided at the VA Medical Center.

2 DEFINITIONS

- A. Alzheimer's: Dementia of the Alzheimer's type is the most common form of dementia (accounting for at least 50 percent of cases) and is characterized by a gradual onset of symptoms, with progressive intellectual deterioration and decline in ability for self-care over a period of several years.
- B. Activities of Daily Living (ADL): Basic activities individuals need to perform to live independently and include bathing, physical ambulation, grooming, dressing, feeding, and toileting.
- C. Admissions: A unit of measurement of productivity; the number of new residents that enter a facility during a specific period.
- D. Average Daily Census: A unit of measurement of productivity; the average number of residents receiving inpatient care each day during a specific period.
- E. Dementia: Dementia is a symptom complex characterized by intellectual deterioration (including disturbances in memory as well as impulse control, language, spatial abilities, judgment, etc.) severe enough to interfere with social or occupational functioning.
- F. Departmental Net to Gross (DNTG) Conversion Factor: A parameter, determined by the VA for each space planning criteria chapter, used to convert the programmed Net Square Foot (NSF) area to the Department Gross Square Foot (DGSF) area. The DNTG Departmental Conversion Factor for Nursing Home / Residential Care Facilities is 1.55.
- G. Full-Time Equivalent (FTE): A work force equivalent to one individual working full time for a specific period, which may be made up of several part-time individuals or one full-time individual. This will include everyone working in the facility; VA and contractor personnel,
- H. General Resident: A resident that does not have special care and/or socialization needs.

- I. House: A replacement term for "unit," comprised of a number of rooms and support spaces, emphasizing the residential, homelike environment required for VA long term care. See also Residential House.
- J. House Care / Work Station: An unobtrusive work area that provides staff with the ability to visually supervise all common areas of the house.
- K. Input Data Statement: A set of questions designed to elicit information about the healthcare project in order to create a Program for Design (PFD) based on the criteria parameters set forth in this document. Input Data Statements could be Mission related, based in the project's Concept of Operations; and Workload or Staffing related, based on projections and data provided by the VHA or the VISN about the estimated model of operation. This information is processed through mathematical and logical operations in SEPS II.
- L. Net-to-department gross factor (NTDG): A factor that when multiplied by the programmed Net Square Foot (NSF) area, determines the Departmental Gross Square Feet (DGSF). The NTDG for Residential Care Developments is **1.55**
- M. Residential Care Facility / Complex: A specialized nursing facility designed to care for residents with long term illness requiring preventive, therapeutic and rehabilitative nursing care services. Nursing, medical and related health care is provided in a homelike environment with specialized clinical and diagnostic services available at the medical center facilities.
- N. Patient Days: A unit of measurement or productivity; the total number of inpatient days of care provided to residents.
- O. Program for Design (PFD): A space program generated by SEPS II based on criteria set forth in this document and specific information about Concept of Operations, Workload projections and Staffing levels authorized.
- P. Provider: An individual, who examines, diagnoses, treats, prescribes medication and manages the care of the patients within his or her scope of practice as established by the governing body of a healthcare organization.
- Q. Residential House: A group of maximum seventeen residents complete with living, dining (possibly kitchen) and support spaces that functions independently for smaller groups of residents. These areas replicate the atmosphere of a large family home and provide the opportunity to co-locate small numbers of residents with similar care needs together to optimize care delivery. An alternate term for "unit". Residential Houses can be suited for General or Specialty Residents.
- R. Residential Neighborhood: A combination of maximum three Residential Houses combined for staffing and spatial efficiencies to share functions such as activity areas, personal laundry, care stations, and clean and soiled utility rooms.
- S. Specialty Resident: A resident with care and/or socialization needs such as dementia, complex medical conditions or chronic behaviors.

- T. Specialty Residential House: A group of twelve to sixteen residents specifically dedicated to residents with care and/or socialization needs such as dementia, complex medical conditions or chronic behaviors.
- U. Staff: Refers to all facility nursing, care-aids, therapy, administration or support staff.
- V. VA-SEPS: Acronym for Space and Equipment Planning System, a digital tool developed by the Department of Defense (DoD) and the Department of Veterans Affairs to generate a Program for Design (PFD) and an Equipment List for a VA healthcare project based on specific information entered in response to Input Data Statements. SEPS II, the current version, incorporates the propositions set forth in all VA space planning criteria chapters. SEPS II has been designed to aid healthcare planners in creating a space plan based on a standardized set of criteria parameters.

3 OPERATING RATIONALE AND BASIS OF CRITERIA

- A. Workload Projections or planned services / modalities for a specific VA medical center, hospital or satellite outpatient clinic project are provided by the VA Central Office (VACO) / VISN CARES Capacity Projection Model and VACO Nursing Home / Residential Care Program input. The workload projections are generated by methodology based upon the expected veteran population in the respective market / service area. Healthcare planners working on VA medical center, hospital or satellite outpatient clinic projects will utilize and apply the workload based criteria set forth herein for identified services and modalities to determine room requirements for each facility.
- B. Space planning criteria have been developed on the basis of an understanding of the activities involved in the functional areas of Nursing Home / Residential Care Facilities and its relationship with other services of a medical facility. These criteria are predicated on established and/or anticipated best practice standards, as adapted to provide environments supporting the highest quality health care for Veterans.
- C. These criteria are subject to modification relative to development in the equipment, medical practice, vendor requirements, and subsequent planning and design. The selection of the size and type of Nursing Home / Residential Care equipment is determined by VACO and upon Veterans Health Administration (VHA) anticipated medical needs.
- D. The number of Residents is determined by the VACO Nursing Home / Residential Care Program Office based on CARES modeling of Nursing Home / Residential Care projected needs. Following are general guidelines for understanding a basis for these projections.
- E. General Resident Number Determination Factors. The number of general residents is based on the following:

- a. Multiply projected general resident admissions by projected average length of stay to obtain projected Resident days.
 - b. Divide projected Resident days by 365 to obtain average daily census.
 - c. Divide average daily census by target utilization or occupancy rate of 95% to calculate total resident beds needed.
 - d. 100% of General Resident beds shall be in single-bed rooms.
- F. Specialty Resident Beds. The need for Specialty Resident beds is based upon the following:
- a. Multiply projected Specialty Resident admissions by projected average length of stay to obtain projected Resident days.
 - b. Divide projected Specialty Resident days by 365 to obtain average daily census.
 - c. Divide average daily census by target utilization or occupancy rate of 95% to calculate Specialty Resident numbers needed.
 - d. 100% of Specialty Residents shall be in single-bed rooms.
- G. House / Neighborhood Size Determination
- a. The size of each house is expressed as the number of resident beds and is influenced by staff to Resident ratios.
 - b. Staffing models shall be developed on an individual project basis with VACO Nursing Home / Residential Care Program Officials, and integrated with the configuration of the facility.

4 PROGRAM DATA REQUIRED (Input Data Statements):

A. Mission:

1. Is the Kitchen / Servery in the General Residential House authorized to serve the Residential Neighborhood (three houses maximum)? (M)
2. Is the Kitchen / Servery in the Specialty Residential House authorized to serve the Residential Neighborhood (three houses maximum)? (M)
3. Is the Kitchen / Servery in the Combined Residential House authorized to serve the Residential Neighborhood (three houses maximum)? (M)
4. Is a Combined Residential House authorized? (M)
5. Is a Medication Room for each Residential Neighborhood authorized? (M)
6. Is a Pharmacy for the Therapeutic Areas authorized? (M)
7. Is a Chapel / Meditation Room for the Resident Support Area authorized? (M)
8. Is a Barber / Beauty Salon for the Resident Support Area authorized? (M)
9. Is a Laundry service for the Resident Support Area authorized? (M)
10. Is a Maintenance / Engineering Shop for the Resident Support Area authorized? (M)
11. Is a Security Office for the Resident Support Area authorized? (M)

B. Workload:

1. How many general beds are projected? (W)
2. How many specialty beds are projected? (W)

C. Staffing:

1. How many Activities Coordinator FTE positions are authorized? (S)
2. How many Nurse Supervisor FTE positions are authorized? (S)
3. How many Therapist FTE positions are authorized? (S)

4. How many Administrative FTE positions are authorized? (S)
5. How many Physician FTE positions are authorized? (S)
6. How many Clerical FTE positions are authorized? (S)

D. Miscellaneous:

1. How many FTEs will work on peak shift? (Misc)
2. How many FTE positions are not authorized to have office or cubicle space? (Misc)

5 SPACE CRITERIA

A. Residential House and Neighborhood

1. **Residential House, General**

Provide one for a minimum of nine and a maximum of seventeen projected General Residents.

2. **Residential House, Specialty**

Provide one for a minimum of seven and a maximum of thirteen projected Specialty Residents.

3. **Residential House, Combined**

Provide one for a minimum of nine and a maximum of seventeen projected General and Specialty Residents.

4. **Residential Neighborhood**

Provide one for a maximum of three General, Specialty or Combined Houses.

B. General Residential House: Resident Areas

1. **Bedroom, Resident (BRNP1).....175 NSF (16.3 NSM)**

Provide one for each General Resident.

2. **Bedroom, Bariatric (BRNP2)320 NSF (29.7 NSM)**

Provide one per General Residential House.

This room is for residents with bariatric care needs, and other conditions which require additional space for mobility and equipment clearances.

3. **Bathroom, Resident (TLTS2).....55 NSF (5.2 NSM)**

Provide one per General Resident Bedroom.

4. **Bathroom, Bariatric (TLTS2)100 NSF (9.3 NSM)**

Provide one per General Bariatric Bedroom

5. **Vestibule (LOB02)50 NSF (4.7 NSM)**

Provide one per General Residential House.

6. **Living Room (DAYR1).....360 NSF (33.4 NSM)**

Minimum NSF; provide an additional 20 NSF per general resident greater than twelve; provide one per General Residential House.

7. **Quiet Room (RAMR1)** **120 NSF (11.1 NSM)**
Provide one per General Residential House.

8. **Dining Room (FSCD1)** **360 NSF (33.4 NSM)**
Minimum NSF; provide an additional 30 NSF per general resident greater than twelve; provide one per Residential House.

Dining Room areas for two or more Houses should be combined into a centralized Neighborhood Dining Room when consistent with program of Operations.

9. **Kitchen and Servery (IPK01)**..... **150 NSF (14.0 NSM)**
Minimum NSF; provide an additional 25 NSF per General Residential House greater than one if serving a Residential Neighborhood.

Minimum space required for staging and serving food. Coordinate the provision, size and configuration of this space with food preparation and delivery system determined in collaboration with Nutrition and Food Service for each facility.

10. **Pantry (SRS01)**..... **80 NSF (7.4 NSM)**
Minimum NSF; provide an additional 10 NSF per General Residential House greater than one if serving a Residential Neighborhood.

Pantries can be combined and shared by two or three houses.

11. **Toilet, Resident / Visitor (TLTU1)** **50 NSF (4.7 NSM)**
Provide one per General Residential House.

12. **Laundry (NURL1)** **100 NSF (9.3 NSM)**
Provide one per General Residential House.

Laundries can be combined and shared by two or three houses.

C. Specialty Residential House: Resident Areas

1. **Bedroom, Resident (BRNP1)** **175 NSF (16.3 NSM)**
Provide one for each Specialty Resident.

2. **Bedroom, Bariatric (BRNP2)**..... **320 NSF (29.7 NSM)**
Provide one per Specialty Residential House.

This room is for residents with bariatric care needs, and other conditions which require additional space for mobility and equipment clearances.

3. **Bathroom, Resident (TLTS2)** **55 NSF (5.2 NSM)**
Provide one per Specialty Resident Bedroom.

4. **Bathroom, Bariatric (TLTS2)**..... **100 NSF (9.3 NSM)**
Provide one per Specialty Bariatric Bedroom

5. **Vestibule (LOB02)** **50 NSF (4.7 NSM)**
Provide one per Specialty Residential House.

6. **Living Room (DAYR1)** **360 NSF (33.4 NSM)**
Minimum NSF; provide an additional 20 NSF per specialty resident greater than ten; provide one per Residential House.

7. **Quiet Room (RAMR1)** **120 NSF (11.1 NSM)**
Provide one per Specialty Residential House.

8. **Dining Room (FSCD1)** **360 NSF (33.4 NSM)**
Minimum NSF; provide an additional 30 NSF per specialty resident greater than ten; provide one per Residential House.

Dining Room areas for two or more Houses should be combined into a centralized Neighborhood Dining Room when consistent with program of Operations.

9. **Kitchen and Servery (IPK01)** **150 NSF (14.0 NSM)**
Minimum NSF; provide an additional 25 NSF per Specialty Residential House greater than one if serving a Residential Neighborhood.

Minimum space required for staging and serving food. Coordinate the provision, size and configuration of this space with food preparation and delivery system determined in collaboration with Nutrition and Food Service for each facility.

10. **Pantry (SRS01)** **80 NSF (7.4 NSM)**
Minimum NSF; provide an additional 10 NSF per Specialty Residential House greater than one if serving a Residential Neighborhood.

Pantries can be combined and shared by two or three houses.

11. **Toilet, Resident / Visitor (TLTU1)** **50 NSF (4.7 NSM)**
Provide one per Specialty Residential House.

12. **Laundry (NURL1)** **100 NSF (9.3 NSM)**
Provide one per Specialty Residential House.

Laundries can be combined and shared by two or three houses.

D. Combined Residential House: Resident Areas

1. **Bedroom, Resident (BRNP1)** **175 NSF (16.3 NSM)**
Provide one for each General and Specialty Resident if combined residential house is authorized.

2. **Bedroom, Bariatric (BRNP2)** **320 NSF (29.7 NSM)**
Provide one per Combined Residential House.

This room is for residents with bariatric care needs, and other conditions which require additional space for mobility and equipment clearances.

3. **Bathroom, Resident (TLTS2)** 55 NSF (5.2 NSM)
Provide one per Combined Resident Bedroom.
4. **Bathroom, Bariatric (TLTS2)**..... 100 NSF (9.3 NSM)
Provide one per Bariatric Bedroom
5. **Vestibule (LOB02)**..... 50 NSF (4.7 NSM)
Provide one per Combined Residential House.
6. **Living Room (DAYR1)** 360 NSF (33.4 NSM)
*Minimum NSF; provide an additional 20 NSF per resident greater than twelve;
provide one per Combined Residential House.*
7. **Quiet Room (RAMR1)** 120 NSF (11.1 NSM)
Provide one per Combined Residential House.
8. **Dining Room (FSCD1)** 360 NSF (33.4 NSM)
*Minimum NSF; provide an additional 30 NSF per resident greater than twelve;
provide one per Residential House.*

Dining Room areas for two or more Houses should be combined into a centralized Neighborhood Dining Room when consistent with program of Operations.

9. **Kitchen and Servery (IPK01)**..... 150 NSF (14.0 NSM)
*Minimum NSF; provide an additional 25 NSF per Combined Residential House
greater than one if serving a Residential Neighborhood.*

Minimum space required for staging and serving food. Coordinate the provision, size and configuration of this space with food preparation and delivery system determined in collaboration with Nutrition and Food Service for each facility.

10. **Pantry (SRS01)**..... 80 NSF (7.4 NSM)
*Minimum NSF; provide an additional 10 NSF per Combined Residential House
greater than one if serving a Residential Neighborhood.*

Pantries can be combined and shared by two or three houses.

11. **Toilet, Resident / Visitor (TLTU1)** 50 NSF (4.7 NSM)
Provide one per Combined Residential House.
12. **Laundry (NURL1)** 100 NSF (9.3 NSM)
Provide one per Combined Residential House.

Laundries can be combined and shared by two or three houses.

E. Residential House (General, Specialty or Combined): Support Areas

1. **House Care / Workstation (NSTA3)**..... 50 NSF (4.6 NSM)
Provide one per Residential House.

This space functions as a nursing sub-station.

2. **Storage, Clean Linen (LCCL1)**.....20 NSF (1.9 NSM)
Provide one per Residential House.
3. **Storage, Soiled Carts (LCSL1)**20 NSF (1.9 NSM)
Provide one per Residential House.
4. **Storage, Equipment (SRE01)**.....100 NSF (9.3 NSM)
Provide one per Residential House.
5. **Storage, Medical Supplies (SRSE1)**.....100 NSF (9.3 NSM)
Provide one per Residential House.
6. **Housekeeping Aides Closet - HAC (JANC1)**.....50 NSF (4.7 NSM)
Provide one per Residential House.

F. Residential Neighborhood: Patient Areas

1. **Activity / Multipurpose (DAYR1)**400 NSF (37.2 NSM)
Minimum NSF; provide an additional 15 NSF per neighborhood resident greater than twenty. Provide one per Residential Neighborhood.
2. **Bathing Suite (TLTS2)**.....360 NSF (33.5 NSM)
Provide one per Residential Neighborhood.

G. Residential Neighborhood: Support Areas

1. **Neighborhood Care (Nursing) Station (NSTA1)**.....250 NSF (23.2 NSM)
Provide one per Residential Neighborhood.
2. **Exam Room (EXRG3)**.....120 NSF (11.2 NSM)
Provide one per Residential Neighborhood.
3. **Medication Room (MEDP1)**.....100 NSF (9.3 NSM)
Provide one per Residential Neighborhood if Medication Room is authorized in Concept of Operations.
7. **Utility Room, Clean (UCCL1)**120 NSF (11.2 NSM)
Provide one per Residential Neighborhood.
8. **Utility Room, Soiled (USCL1)**100 NSF (9.3 NSM)
Provide one per Residential Neighborhood.
9. **Housekeeping Aides Closet - HAC (JANC1)**.....50 NSF (4.7 NSM)
Provide one per Residential Neighborhood.
10. **Storage, Stretcher / Wheelchair (SRLW1)**60 NSF (5.6 NSM)
Provide one per Residential Neighborhood.

H. Residential Neighborhood: Staff and Administrative Areas

1. **Office, Activities Coordinator (OFDC1)**120 NSF (11.2 NSM)

Provide one per Activities Coordinator FTE position authorized.

2. **Office, Nurse Supervisor (OFD03)**..... 120 NSF (11.2 NSM)
Provide one per Nurse Supervisor FTE position authorized.

3. **Conference / Classroom (CRA01)** 240 NSF (22.3 NSM)
Provide one per Residential Neighborhood.

Could be combined and shared by two neighborhoods.

4. **Toilet, Staff (TLTU1)** 50 NSF (4.7 NSM)
Provide one if total number of Residential Neighborhood FTE positions authorized is between three and fifteen. Provide an additional one if total number of Residential Neighborhood FTE positions authorized if greater than fifteen.

I. Therapeutic Areas.

1. **Physical Therapy (PTEA1)** 400 NSF (37.2 NSM)
Provide one for Nursing Home / Residential Care.

2. **Occupational Therapy (OTDL1)**..... 300 SF (27.9 NSM)
Provide one for Nursing Home / Residential Care.

3. **Office, Therapist (OFD03)** 120 NSF (11.2 NSM)
Minimum NSF; provide an additional 50 NSF per each increment of four Therapist FTE positions authorized greater than two.

4. **Pharmacy (MEDP1)**..... 160 NSF (14.9 NSM)
Provide one if Pharmacy is authorized in Concept of Operations.

5. **Toilet, Resident (TLTU1)** 50 NSF (4.7 NSM)
Provide one for Nursing Home / Residential Care.

J. Resident Support Areas.

1. **Chapel / Meditation (RAMR1)**..... 300 NSF (27.9 NSM)
Provide one if Chapel / Meditation is authorized in Concept of Operations.

2. **Barber / Beauty Salon (XXYYC)**..... 240 NSF (22.3 NSM)
Provide one if Barber / Beauty Shop is authorized in Concept of Operations.

3. **Laundry (LCCL1)**..... 600 NSF (55.8 NSM)
Provide one if Laundry is authorized in Concept of Operations.

Laundry service is usually provided by commercial service or VAMC EMS Laundry and Linen Operation. Space indicated is for nominal stand-alone Residential Care Facility based operation to be provided only when authorized by VACO.

4. **Housekeeping (XXYYC)**..... 200 NSF (18.6 NSM).
Provide one for Nursing Home / Residential Care.

Provides nominal staging and storage area for housekeeping supplies and personnel.

5. **Maintenance / Engineering Shop (PMCC1)**.....**800 NSF (74.3 NSM)**
Provide one if Maintenance and Engineering Shop is authorized in Concept of Operations.

Maintenance and Engineering Shops usually provided by adjacent VAMC Engineering Service. Space indicated is for nominal shop facilities to be provided only for stand alone facility not located on a VAMC campus. Space to be subdivided into receiving, shops, storage, staging, and shop areas

6. **Office, Security (COM03)****200 NSF (18.6 NSM)**
Provide one if Security service is authorized in Concept of Operations.

Security facilities are usually provided by adjacent VAMC Police Service. Space indicated is for nominal control/office/staging facilities to be provided only for stand alone facility not located on a VAMC campus.

7. **Receiving / Loading (MMRP1)****150 NSF (13.9 NSM)**
Provide one for Nursing Home / Residential Care

Space provided for receipt and staging of materiel from either VAMC delivery system or stand-alone facility loading dock. For additional Receiving/Loading areas required for food service refer to Nutrition and Food Service – Chapter 224.

8. **Storage, Bulk (SRE01)****100 NSF (9.4 NSM)**
Provide one for Nursing Home / Residential Care.

Space provided for storage of bulk materiel. For additional Bulk Storage areas as may be required for food service refer to Nutrition and Food Service – Chapter 224.

9. **Food Preparation (FSNP1)****0 NSF (0 NSM)**
Refer to Nutrition and Food Service Chapter 224

10. **Storage, Resident (SRPB1)****150 NSF (13.9 NSM)**
Minimum NSF; provide an additional 2 NSF per projected General and Specialty Resident greater than forty-eight.

Storage for resident clothing, luggage and other personal items.

K. Staff and Administrative Areas.

1. **Lobby (LOB01)**.....**200 NSF (18.6 NSM)**
Provide one for Nursing Home / Residential Care.

2. **Toilet, Visitor / Resident (TLTU1)**.....**50 NSF (4.7 NSM)**
Provide two for Nursing Home / Residential Care.

3. **Office, Service Chief (OFC01)**..... 150 NSF (14.0 NSM)
Provide one for Nursing Home / Residential Care.
4. **Office, Nursing Administration (OFA01 / OFA02)**..... 120 NSF (11.2 NSM)
Provide one per Administrative FTE position authorized; provide OFA01 if standard furniture is authorized or OFA02 if systems furniture is authorized.
5. **Office, Physician (OFD03)**..... 120 NSF (11.2 NSM)
Provide one per Physician FTE position authorized.
6. **Conference Room (CRA01)**..... 300 NSF (27.9 NSM)
Provide one for Nursing Home / Residential Care.
7. **Medical Records / QA (MRS01)** 150 NSF (14.0 NSM)
Provide one for Nursing Home / Residential Care.
8. **Copy Room (RPR01)**..... 100 NSF (9.4 NSM)
Provide one for Nursing Home / Residential Care.
9. **Cubicle, Clerical (OFA03)**..... 64 NSF (5.9 NSM)
Provide one per clerical FTE position authorized.
10. **Toilet, Staff (TLTU1)** 50 NSF (4.7 NSM)
Provide one for Nursing Home / Residential Care.

L. Staff Lockers, Lounge, and Toilets

The spaces below provide programming of Lounge, Lockers, and Toilets at department / service / chapter level. Alternatively, sum all departments/services data for Lockers, Lounges and Toilets, and program space in Chapter 410-EMS Lockers, Lounges, Toilets and Showers. Either/or – do not duplicate space. Provide locker space only for those FTEs without office or cubicle space.

1. **Lounge, Staff (SL001)**..... 80 NSF (7.5 NSM)
Minimum NSF; provide an additional 15 NSF per each projected FTE on peak shift greater than five; maximum 210 NSF

For less than five FTE combine Lounge facilities with adjacent department or sum in chapter 410.

2. **Locker Room, Staff (LR001)**..... 80 NSF (7.5 NSM)
Minimum NSF if total number of FTEs for whom office or cubicle space is not authorized is between five and thirteen; provide an additional 6 NSF per FTE for whom office or cubicle space is not authorized greater than thirteen.

Provide locker space only for those FTEs without assigned office or cubicle space. For less than five FTE combine Locker Room facilities with adjacent department or sum in chapter 410.

3. **Toilet, Staff (TLTU1)** 50 NSF (4.7 NSM)
Minimum one; provide an additional staff toilet for each increment of five projected FTEs on peak shift greater than thirteen.

6 PLANNING AND DESIGN CONSIDERATIONS

- A. A residential care environment provides living, treatment and support space in a residential, home-like setting for qualified veterans.
- B. Employ a resident “house” concept consisting of smaller groupings of resident rooms co-located with living, dining, and kitchen areas.
- C. Employ a “Residential Neighborhood” concept, which involves co-location of support services between or amongst houses.
- D. Encourage resident interaction and privacy by providing space for larger social activities and private spaces.
- E. Incorporate design features that facilitate activities of daily living.
- F. Provide clear spatial organization and “way-finding” cues.
- G. Encourage resident access to the outdoors for active and passive therapeutic activities.
- H. The use of single (private) resident bed rooms is encouraged.
- I. Provide 100 percent accessibility in all resident areas both indoors and out.
- J. The net-to-gross conversions factor for estimating department gross square feet (DGSF) is 1.55. This number, when multiplied by the programmed net square foot area, gives an estimate of the DGSF.
- K. Plan to maximize, to the degree possible, staff efficiencies by arranging resident units consistent with staffing patterns.
- L. Provide adequate space for supplies and equipment to promote worker safety and care delivery (e.g., ceiling lifts) .

7 FUNCTIONAL RELATIONSHIPS (MATRIX)

TABLE 1: FUNCTIONAL RELATIONSHIP MATRIX: SAME BUILDING

SERVICES	RELATIONSHIP	REASON
Audio and Speech Pathology Program	3	G,H
Canteen Service	3	G,H
Chaplain Service	3	G,H
Dental Service	3	G,H
Dietetic Service	3	G,H
Eye Clinic	3	G,H
ENT Clinic	3	G,H
Laboratory Service	3	G,H
Voluntary Service	3	G,H
Med. Res. And Dev. – Animal Res.	X	G,H
Warehouse and Maintenance Shops	X	G,H

TABLE 2: FUNCTIONAL RELATIONSHIP MATRIX: SEPARATE BUILDING

SERVICES	RELATIONSHIP	REASON
Parking Facilities	3	G,H
Ambulatory Care	3	G,H
Audio and Speech Pathology Program	3	G,H
Dental Service	3	G,H
Dietetic Service-Food Proc.	3	A, B,H
ENT Clinic	3	G
Eye Clinic	3	G
Laboratory Service	3	C,H
Pharmacy Service	3	B
Voluntary Service	3	G,H
Med. Res. And Dev. – Animal Res.	X	K, E, F
Warehouse and Maintenance Shops	X	D, E, F

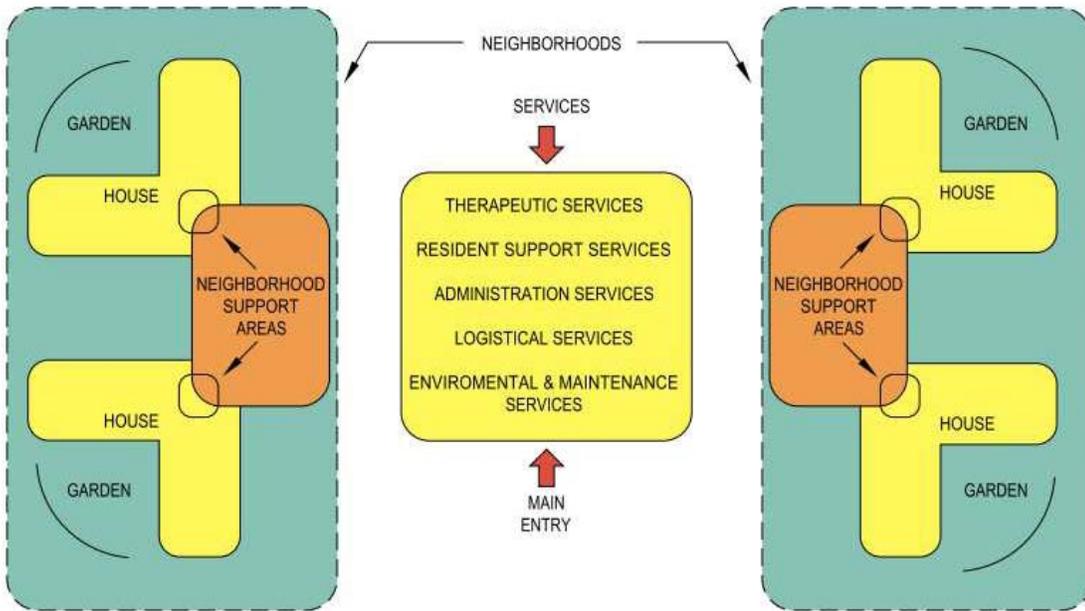
Relationship

1. Adjacent
2. Close/Same Floor
3. Close/Different Floor Acceptable
4. Limited Traffic
- X. Separation Desirable

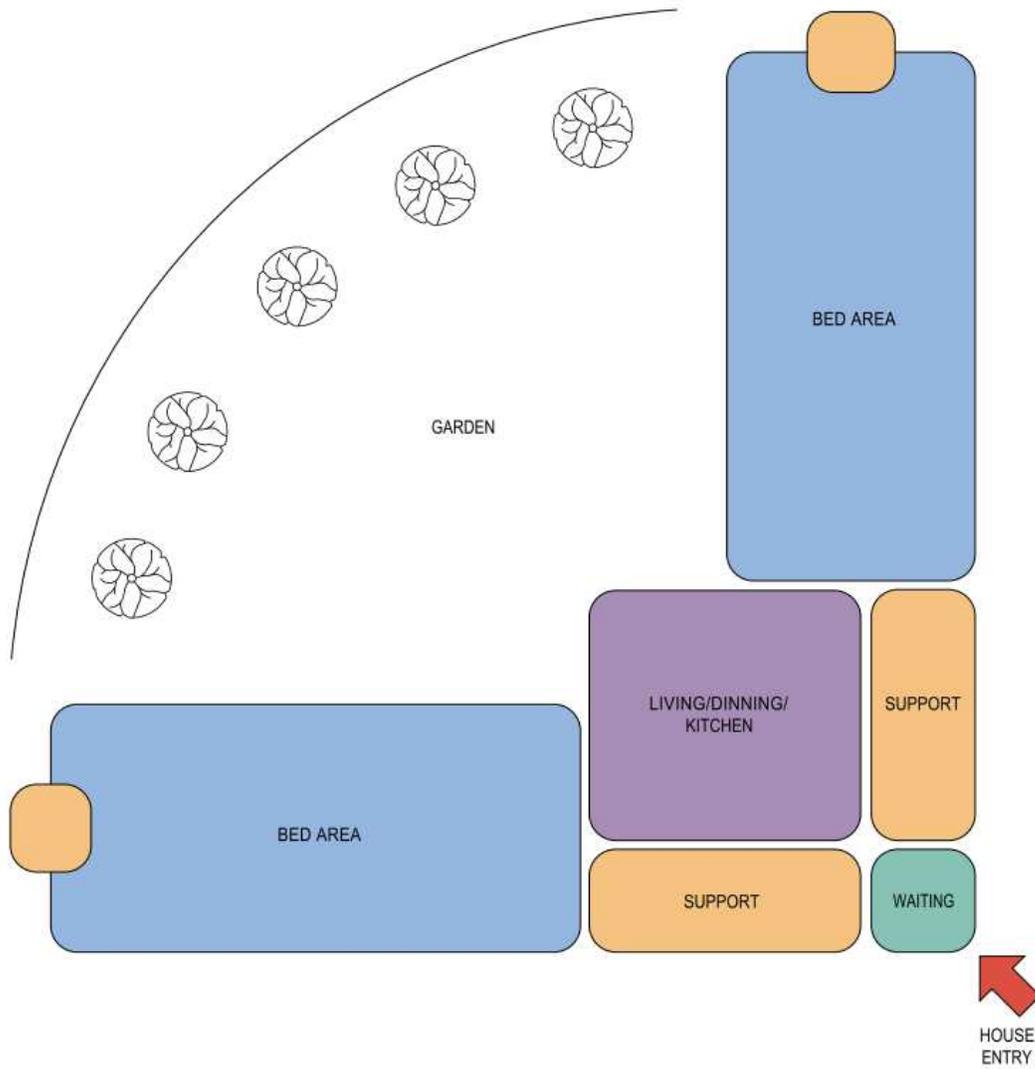
Reasons:

- A. Common use of resources
- B. Accessibility of supplies
- C. Urgency of contact
- D. Noise or vibration
- E. Presence of odors or fumes
- F. Contamination hazard
- G. Sequence of work
- H. Resident's convenience
- I. Frequent contact
- J. Need for security
- K. Others (specify)
- L. Closeness inappropriate

8 FUNCTIONAL DIAGRAM 1 - Concept Diagram - Nursing Home / Residential Care Facility



9 FUNCTIONAL DIAGRAM 2 - Concept Diagram – Nursing Home / Residential Care Facility – Typical House





Appendix

Northern Utah State Veterans Nursing Home

Department of Veterans Affairs

Ogden, Utah

6.5 Utah Administrative Code R432-5 Nursing Facility Construction

Rule R432-5. Nursing Facility Construction.

As in effect on May 1, 2008

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- R432-5-14. Mechanical Standards.
- R432-5-15. Electric Standards.
- R432-5-16. Exclusions to the Guidelines.
- R432-5-17. Penalties.
- KEY
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R432-5-1. Legal Authority.

This rule is promulgated pursuant to Title 26, Chapter 21.

R432-5-2. Purpose.

The purpose of this rule is to promote the health and welfare through the establishment and enforcement of construction standards. The intent is to provide residential like environments and encourage social interaction of residents.

R432-5-3. Definitions.

(1) "Special Care Unit" means a physical area within a licensed facility designated for the housing and treatment of residents diagnosed with a specifically defined disease or medical condition.

(2) "Room or Office" when used in this rule describes a specific, separate, enclosed space for the service. When room or office is not used, multiple services may be accommodated in one enclosed space.

R432-5-4. Description of Service.

(1) A nursing unit shall consist of resident rooms, resident care spaces, and services spaces.

(2) Each nursing unit shall contain at least four resident beds.

(3) Rooms and spaces composing a nursing unit shall be contiguous.

(4) A nursing care facility operated in conjunction with a general hospital or other licensed health care facility shall comply with all provisions of this section. Dietary, storage, pharmacy, maintenance, laundry, housekeeping, medical records, and laboratory functions may be shared by two or more facilities.

(5) Special care units shall comply with all provisions of R432-5.

(6) Windows, in rooms intended for 24-hour occupancy, shall be operable.

R432-5-5. General Design Requirements.

R432-4-1 through R432-4-23, and 24(3) apply with the following modifications.

(1) Fixtures in all public and resident toilet and bathrooms shall comply with Americans with Disabilities Act Accessibility Guidelines, (ADAAG) 28 CFR 36, Appendix A, (July 1993). These rooms shall be wheelchair accessible with wheelchair turning space within the room.

(2) Lavatories, counters, and door clearances within resident rooms shall be wheelchair accessible.

R432-5-6. General Construction Requirements.

(1) Nursing facilities shall be constructed in accordance with the Guidelines for Design and Construction of Hospital and Health Care Facilities (Guidelines), Section 8 and Appendix A, 2001 edition which is adopted by reference.

(2) Where a modification is cited, the modification supersedes conflicting requirements of the Guidelines.

R432-5-7. Nursing Unit.

(1) When more than one nursing unit shares spaces and service areas, as permitted in this rule, the shared spaces and service areas shall be contiguous to each nursing unit served.

(2) Facility service areas shall be accessible from common areas without compromising resident privacy.

(3) Each nursing unit shall have a maximum number of 60 beds.

(4) At least two single-bed rooms, each with private toilet room containing a toilet, lavatory, and bathing facility shall be provided for each nursing unit.

(a) In addition to the lavatory in the toilet room, in new construction and remodeling, a lavatory or handwashing sink shall be provided in the resident room.

(b) Ventilation shall be in accordance with Table 6 with all air exhausted to the outside.

(5) Each room shall have a window in accordance with R432-4-23(5).

(6) Each resident closet shall be a minimum of 22 inches deep by 36 inches wide with a shelf to store clothing and a clothes rod positioned to accommodate full length garments.

(7) A nurse call system is not required in facilities which care for persons with mental retardation or developmental disabilities. With prior approval of the Department, a nursing facility may modify the system to alleviate hazards to residents.

(8) Handwashing facilities shall be located near the nursing station and the drug distribution station.

(9) A staff toilet room may also serve as a public toilet room if it is located in the nursing unit.

(10) A clean workroom or clean holding room with a minimum area of 80 square feet shall provide for preparing resident care items.

(a) The clean work room shall contain a counter, handwashing facilities and storage facilities.

(b) The work counter and handwashing facilities may be omitted in rooms used only for storage and holding, as part of a larger system for distribution of clean and sterile supply materials.

(11) If a medical cart is used it shall be under visual control of staff.

(a) Double locked storage shall be provided for controlled drugs.

(b) Provisions shall be made for receiving, assembling, and storage of drugs and other pharmacy products.

(12) If a closed cart is used for clean linen storage, it shall be stored in a room with a self closing door. Storage in an alcove in a corridor is prohibited.

(13) Ice intended for human consumption shall be dispensed by self dispensing ice makers. Bin type storage units are prohibited.

(14) Gurney showers for residents may be provided at the option of the facility.

(a) One bathtub and shower shall be provided on each nursing floor in addition to bath fixtures in resident toilet rooms.

(b) At least one shower on each floor shall be at least four feet square without curbs designed for use by a resident using a wheelchair.

(c) Each resident bathtub and shower shall be in a separate room or enclosure large enough to ensure privacy and to allow staff to assist with bathing, drying, and dressing.

(15) At least one toilet room shall be provided on each floor containing a nursing unit to be used for resident toilet training.

(a) The room shall contain a toilet and lavatory with wheelchair turning space within the room.

(b) A toilet room with direct access from the bathing area shall be provided at each central bathing area if a toilet is not otherwise provided in the bathing area. The toilet training facility may serve this function if there is direct access from the bathing area.

(c) Doors to toilet rooms shall have a minimum width of 34 inches to admit a wheelchair. The doors shall permit access from the outside in case of an emergency.

(d) A handwashing fixture shall be provided in each toilet room.

(16) An equipment storage room with a minimum area of 120 square feet for portable equipment shall be provided.

R432-5-8. Resident Support Areas.

(1) Occupational therapy service areas may be counted in the calculation of support space.

(2) Physical Therapy, personal care room, and public waiting lobbies shall not be included in the calculation of support space.

(3) There shall be resident living areas equipped with tables, reading lamps, and comfortable chairs designed to be usable by all residents.

(4) There shall be a general purpose room with a minimum area of 100 square feet equipped with a table and comfortable chairs.

(5) A minimum area of ten square feet per bed shall be provided for outdoor recreation. This space shall be provided in addition to the setbacks on street frontages required by local zoning ordinances.

(6) Examination and Treatment rooms.

(a) An examination and treatment room shall be provided except when all resident rooms are single bed rooms.

(b) An examination and treatment room may be shared by multiple nursing units.

(c) When provided, the room shall have a minimum floor area of 100 square feet, excluding space for vestibules, toilet, closets, and work counters, whether fixed or moveable.

(d) The room shall contain a lavatory equipped for handwashing, work counter, storage facilities, and a desk, counter, or shelf space for writing.

(7) In addition to facility general storage areas, at least five square feet per bed shall be provided for resident storage.

R432-5-9. Rehabilitation Therapy.

(1) A separate storage room for clean and soiled linen shall be provided contiguous to the rehabilitation therapy area.

(2) Storage for rehabilitation therapy supplies and equipment shall be provided.

R432-5-10. General Services.

(1) Linen services shall comply with R432-4-24(3).

(2) There shall be one housekeeping room for each nursing unit.

(3) Yard equipment and supply storage areas shall be located so that equipment may be moved directly to the exterior without passing through building rooms or corridors.

R432-5-11. Waste Storage and Disposal.

Facilities and equipment shall be provided for the sanitary storage and treatment or disposal of all categories of waste, including hazardous and infectious wastes if applicable, using techniques defined by the Utah Department of Environmental Quality, and the local health department having jurisdiction.

R432-5-12. Details and Finishes.

(1) Grab bars shall be installed in all toilet rooms in accordance with the ADAAG.

(2) Corridor and hallway handrails shall comply with ADAAG. The top of the rail shall be 34 inches above the floor, except for areas serving children and other special care areas.

(3) Cubicle curtains and draperies shall be affixed to permanently mounted tracks or rods. Portable curtains or visual barriers are not permitted.

(4) Signs shall be provided as follows:

(a) general and circulation direction signs in corridors;

(b) identification at each door; and

(c) emergency directional signs;

(d) all signs in corridors shall comply with ADAAG.

(5) Partitions, floor and ceiling construction in resident areas shall comply with the noise reduction criteria of Table 1 for sound control.

TABLE 1

Sound Transmission Limitations
in Long-Term Care Facilities

Airborne Sound Transmissions
Transmissions Class (STC) (a)

Class (IIC) (b) (Residents')	Partitions	Floors
room to resident's room	35	40
Public space to (residents) room (b)	40	40
Service areas to (residents') room (c)	45	45

(a) Sound transmissions (STC) shall be determined by tests in accordance with Standard E90 and ASTM Standard E413. Where partitions do not extend to the structure above, the designer shall consider sound transmissions through ceilings and composite STC performance.

(b) Public space includes lobbies, dining rooms, recreation rooms, treatment rooms, and similar space.

(c) Service areas include kitchens, elevators, elevator machine rooms, laundry rooms, garages, maintenance rooms, boilers and mechanical equipment rooms and similar spaces of high noise. Mechanical equipment located on the same floor or above patient's rooms, offices, nurses' stations, and similarly occupied space shall be effectively isolated from the floor.

R432-5-13. Elevators.

At least one elevator serving all levels shall accommodate a gurney with attendant and have minimum inside cab dimensions of 5'8" wide by 8'5" deep and a minimum clear door width of 3'8".

R432-5-14. Mechanical Standards.

(1) Mechanical tests shall be conducted prior to final Department construction inspection.

(2) Written test results shall be retained in facility maintenance files and available for Department review.

(3) Air Conditioning, Heating, and Ventilating Systems shall include:

(a) A heating system capable of maintaining a temperature of 80 degrees Fahrenheit in areas occupied by residents.

(b) A cooling system capable of maintaining a temperature of 72 degrees Fahrenheit in areas occupied by residents.

(c) Evaporative coolers may only be used in kitchen hood systems that provide 100% outside air.

(d) Isolation rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. No air shall be recirculated into the building system.

(e) Supply and return systems must be within a duct. Common returns using corridor or attic spaces as return plenums are prohibited.

(f) Filtration shall be provided when mechanically circulated outside air is used.

(g) Hoods.

(i) All hoods over cooking ranges shall be equipped with grease filters, fire extinguishing systems, and heat activated fan controls.

(ii) Cleanout openings shall be provided every 20 feet in horizontal sections of duct systems serving the hoods.

(h) Gravity exhaust may be used, where conditions permit, for boiler rooms, central storage, and other nonresident areas.

(4) Plumbing and other Piping Systems shall include:

(a) Handwashing facilities that are arranged to provide sufficient clearance for single lever operating handles.

(b) Dishwashers, disposal and appliances that are National Sanitation Foundation (NSF) approved and have the NSF seal affixed.

(c) Kitchen grease traps that are located and arranged to permit access without the need to enter food preparation or storage areas.

(d) Hot water provided in patient tubs, showers, whirlpools, and handwashing facilities that is regulated by thermostatically controlled automatic mixing valves. These valves may be installed on the recirculating system or on individual inlets to appliances.

R432-5-15. Electric Standards.

(1) Operators shall maintain written certification to the Department verifying that systems and grounding comply with NFPA 99 and NFPA 70.

(2) Approaches to buildings and all spaces within buildings occupied by people, machinery, or equipment shall have fixtures for lighting in accordance with the requirements of the Illuminating Engineering Society of North America (IESNA). Parking lots shall have fixtures for lighting to provide light levels as recommended in IES Recommended Practice RP-20-1998, Lighting for parking facilities by the Illuminating Engineering Society of North America.

(3) Automatic emergency lighting shall be provided in accordance with NFPA 99 and NFPA 101.

(4) Each examination and work table shall have access to a minimum of two duplex outlets.

(5) Receptacles and receptacle cover plates on the emergency system shall be red.

(6) An on-site emergency generator shall be provided in all nursing care facilities except small ICF/MR health care facilities of 16 beds or less.

(a) In addition to requirements of NFPA 70, Section 517-40, the following equipment shall be connected to the critical branch of the essential electrical system.

(i) heating equipment necessary to provide heated space sufficient to house all residents under emergency conditions,

(ii) duplex convenience outlets in the emergency heated area at the ratio of one duplex outlet for each ten residents,

(iii) nurse call system,

(iv) one duplex receptacle in each resident bedroom.

(b) Fuel storage shall permit continuous operation of the services required to be connected to the emergency generator for 48 hours.

R432-5-16. Exclusions to the Guidelines.

The following sections of the Guidelines do not apply:

(1) Parking, Section 8.1.F.

(2) Program of Functions, Section 8.1.G.

(3) Clean workroom, Subsection 8.2.C.5.

(4) Linen Services, section 8.11.

(5) Clusters and Staffing Considerations, section A8.2.A. The cluster design concept has proven beneficial in numerous cases, but is optional. However, the Department encourages new construction projects to consider this concept.

R432-5-17. Penalties.

The Department may assess a civil money penalty of up to \$5,000 and deny approval for patient utilization of new or remodeled areas if a health care provider does not submit architectural drawings to the Bureau of Licensing. The Department may assess a civil money penalty of up to \$5,000 if the licensee fails to follow Department- approved architectural plans. The Department may assess a civil money penalty of up to \$500 per day for each day a new or renovated area is occupied prior to Bureau of Licensing approval.

KEY

health facilities

Date of Enactment or Last Substantive Amendment

January 15, 2003

Notice of Continuation

January 5, 2004

Authorizing, Implemented, or Interpreted Law

26-21-5; 26-21-16

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Appendix

Northern Utah State Veterans Nursing Home

Department of Veterans Affairs

Ogden, Utah

6.6 Rocky Mountain Power Energy FinAnswer New Construction Design Assistance Manual



Energy FinAnswer[®]

New Construction Design Assistance

Utah Participant Program Manual

Do the
**bright
thing**

January 1, 2008

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Rocky Mountain Power is offering Energy FinAnswer *New Construction Design Assistance* for new construction/major renovation projects. Through this program, Rocky Mountain Power seeks to obtain verifiable electric energy and demand savings by encouraging the design team to integrate energy efficiency strategies into the building design. Rocky Mountain Power rewards participation in the program by providing the following services and incentives:

- **Design Professional Honorarium Payment**—incentive available for bringing a project to the program early (optimally, prior to completion of schematic design)¹
- **Design Assistance Consulting Services**—electric energy savings will be obtained through the implementation of a comprehensive selection of energy efficiency measures (EEMs) identified during the design process by an energy consultant.
- **Design Team Reimbursement for Efficient Design**—Rocky Mountain Power offers a design team reimbursement for specific activities that contribute to a design that exceeds Utah energy code (International Energy Conservation Code - IECC 2006) by at least 10% in the final construction documents. The design team reimbursement is payable following Rocky Mountain Power’s review that the construction documents contain electric EEMs exceeding the 10% threshold.
- **Monetary Incentives to the Building Owner**—building owner/customer incentive levels reflect a single award payment based on verified energy savings of the installed measures. For some EEMs, the energy savings must be verified when the weather is appropriate to confirm proper system operation. The owner will receive the incentive after the energy savings of the EEMs have been verified and a final inspection has been performed.

¹ Rocky Mountain Power must not already have a signed Letter of Intent or New Construction Design Assistance Application/Agreement for the project.

Projects meeting the following criteria are eligible to participate in the Energy FinAnswer *New Construction Design Assistance* program:

1. Projects involving commercial or industrial buildings² planned for new construction or major renovation,
2. Projects where energy code applies (energy savings and project costs will be determined compared to a code compliant building),
3. Projects where the building either does or will receive electric service in Utah on a Rocky Mountain Power retail rate schedule (refer to the service territory map in Appendix A), and
4. Projects where the scope will be improving the electric efficiency of the whole building so it exceeds Utah energy code (IECC 2006) by 10% or more based on modeling consistent with the modeling guidelines in ASHRAE 90.1-2004 Appendix G protocols.

The intent is once a project begins in Energy FinAnswer *New Construction Design Assistance*, it remains in this program track. However, if your project does not meet one or more of the other criteria, Rocky Mountain Power offers other energy efficiency incentives and services that may help you meet your energy efficiency goals. See Section 5 for an overview and visit www.rockymountainpower.net/utsave or contact us for details.

This program manual includes detailed information about the Energy FinAnswer New Construction Design Assistance program, instructions on how to participate, and responsibilities for each of the participants. This manual is intended for building owners/customers as well as design professionals.

This manual is organized as follows:

- Section 2 outlines the requirements for the New Construction Design Assistance program,
- Section 3 summarizes the incentive offer for the New Construction Design Assistance program,

² For industrial buildings, the systems covered by Utah energy code are eligible for design assistance services and incentives. Process equipment, compressed air or other systems not covered by Utah energy code are eligible for energy efficiency services and incentives however project requirements vary depending on the chosen program. Visit our Web site or contact us for details.

- Section 4 provides an overview of the program process,
- Section 5 provides an overview of Rocky Mountain Power’s other commercial and industrial energy efficiency program offerings available in Utah,
- Appendix A contains a map showing the approximate service territory covered by Rocky Mountain Power within the State of Utah,
- Appendix B provides a sample copy of the Project Application/Agreement application,
- Appendix C contains a sample copy of the Design Team Reimbursement agreement,
- Appendix D contains a sample copy of the Building Owner Incentive Agreement,
- Appendix E contains an outline of energy simulation requirements for the Certification path,
- Appendix F contains a template of the Commissioning Report,
- Appendix G contains program definitions,
- Appendix H contains a list of key resources for the program, and
- Appendix I contains frequently asked questions and answers.

Section 2

New Construction Design Assistance Program Overview

The Energy FinAnswer *New Construction Design Assistance* program track is designed to achieve energy and demand savings in commercial and industrial buildings within the Utah service territory. Energy efficiency measures that exceed Utah energy code are identified through interactive energy analyses of building systems to determine the most energy efficient and cost effective design.

2.1 ELIGIBILITY REQUIREMENTS

Projects meeting the following criteria are eligible to participate in the Energy FinAnswer *New Construction Design Assistance* program:

1. Projects involving commercial or industrial buildings planned for new construction or major renovation,
2. Projects where energy code applies (energy savings and project costs will be determined compared to a code compliant building),
3. Projects where the building either does or will receive electric service in Utah on a Rocky Mountain Power retail rate schedule (refer to the service territory map in Appendix A), and
4. Projects where the scope will be improving the electric efficiency of the whole building so it exceeds Utah energy code (IECC 2006) by 10% or more based on modeling consistent with the modeling guidelines in ASHRAE 90.1-2004 Appendix G protocols.

Projects should be in the earliest stages of programming or schematic design and the systems in the building should be subject to the state energy code. A high degree of flexibility must still be available regarding choices for building design, envelope, HVAC and electrical systems. Early involvement in the design process by Rocky Mountain Power's design assistance team ensures that all energy-saving options can be considered.

Eligible energy measures include permanently installed equipment which can improve the efficiency of a Customer's electric energy use. Energy efficiency measures designed to primarily reduce average monthly demand must also improve the electric energy efficiency to be eligible for the program.

2.2 BASELINE DEFINITION

A baseline energy simulation model will be created in accordance with the requirements set forth in ASHRAE 90.1-2004 Informative Appendix G (including addendum's) and the minimum equipment efficiency requirements from Utah Energy code (IECC 2006). This baseline model provides a consistent benchmark against which to compare energy performance metrics and energy savings for subsequent energy strategy alternatives.

Only energy savings achieved above this baseline level will be eligible to receive incentives. This concept is further illustrated in Figure 1.

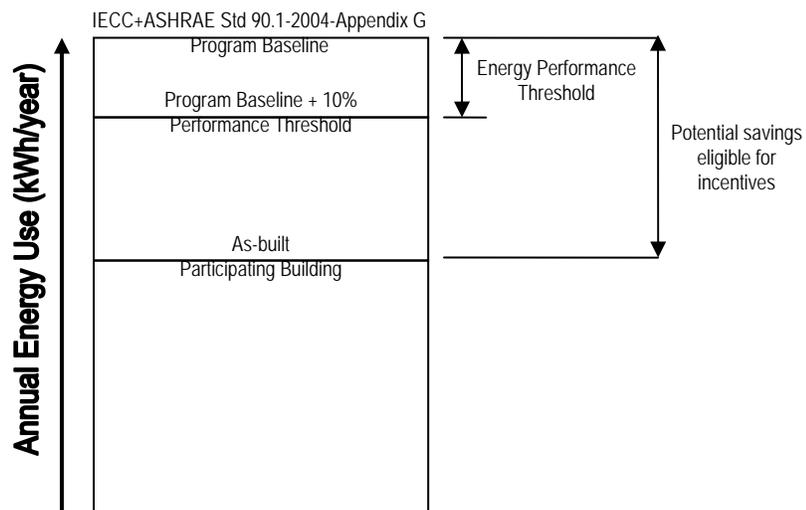


Figure 1. Illustration of program baseline and savings eligibility

ASHRAE 90.1-2004 Informative Appendix G contains the list of approved energy simulation programs.

2.3 CALCULATION OF ENERGY IMPACTS

Energy savings will be calculated as the baseline (code compliant) annual energy use minus the as-built annual energy use as determined by the energy simulation model. The average monthly electrical demand savings will be based on the monthly maximum demand use of the baseline energy simulation model minus that of the as-built model.

The design team incentive payment is contingent on the design documented in final construction documents (CDs) exceeding the approved baseline by at least 10% on a whole building electric basis.

Building owner/customer incentives are contingent on the as-built building exceeding the approved baseline by at least 10% on a whole building electric basis. The verified as-built energy impacts will be based upon the results of a final inspection report paid for by Rocky Mountain Power.

To ensure a comprehensive approach to building efficiency, energy savings associated with lighting-related measures is capped at 75% of the total project's electrical savings. If the cap is reached, the building owner incentives will be adjusted to limit the savings from lighting to 75% of the total project electrical savings. See Section 3 for more information about Incentives.

At the owner's request, non-electric savings (e.g., fossil fuel savings) may be provided in the reports insofar as the savings are output from the energy simulation model and are for informational purposes only. Owners are welcome to request additional services from Rocky Mountain Power's energy consultant under a separate owner paid contract with the consultant. These items may include: quantifying natural gas, water, or maintenance savings, LEED submittal requirements, etc.

Section 3 Incentives – Building Owner and Design Team

3.1 BUILDING OWNER INCENTIVES

To help offset incremental costs associated with energy efficiency measures, financial incentives are available to building owners/customers and paid upon completion of commissioning and delivery of the final inspection report.

The building owner incentive is payable in the form of a one-time lump-sum check that is equal to:

$(\$0.12 \times \text{annual electricity (kWh/year) saved}) + (\$50 \times \text{average electrical demand (kW/month) saved})$ as determined in the final inspection report.

Customers sign an incentive agreement with Rocky Mountain Power prior to signing purchase orders for their project. The building owner incentive will be paid based on the energy and demand savings in the final inspection report and per the terms of the fully executed incentive agreement.

Energy savings threshold: Building owner incentive payments are contingent on the as-built building exceeding Utah energy code by 10% on a whole building electric basis. If the energy savings threshold is not met, no incentives are available through Energy FinAnswer New Construction Design Assistance. Incentives may be available through Energy FinAnswer or FinAnswer Express (incentive caps may apply).

Lighting savings limit: If lighting measure savings exceed 75% of the total project's electric savings, the incentives will be adjusted to limit the savings from lighting to 75% of the total project savings. The lighting savings limit applies to the following items:

- Reduction in connected lighting loads (lighting power density reductions),
- Interactive effects realized at the HVAC system, and
- Lighting control strategies not required by code including daylighting and other forms of lighting controls

Commissioning requirement: Measures requiring commissioning are identified in the energy analysis report provided by Rocky Mountain Power. For these measures, commissioning must be completed to receive a full building owner incentive. Commissioning is required to be completed when the building is fully occupied and when the system's operation can be verified. Some measures may require operation during the cooling or heating seasons.

Commissioning opt-out: Owners may opt out of commissioning and receive a 20 percent deduction in the otherwise applicable incentive. The project must still meet the 10% energy savings threshold after the commissioning derate to be eligible for building

owner incentives. This option does not affect the design professional honorarium or design team reimbursement.

3.2 DESIGN TEAM INCENTIVES

The design team incentive package is intended to encourage designers and engineers to bring projects to the program (Design Professional Honorarium) and to offset a portion of the expenses for participation in the program (Design Team Reimbursement). A summary of each type is provided in the sections below.

3.2.1 Design Professional Honorarium

A \$1,000 design team honorarium is currently offered to design professionals involved in new construction or major renovation projects to encourage their participation early in the design phase. To receive the honorarium, the applicant must be a design professional of record for the project, provide the signed New Construction Design Application/Agreement for Services for the project³, and submit a completed Design Professional Honorarium application early in the design phase (prior to completion of schematic design). The honorarium is payable upon Rocky Mountain Power's receipt, review and approval of the honorarium application.

As long as the design professional meets the above requirements, the honorarium can be provided for either the Design Assistance Path option or the Certification Path, both of which are described in detail below.

3.2.2 Design Team Reimbursement

The design team reimbursement can offset a portion of the expenses for the design team's participation, which is a critical component to the success of the design assistance initiatives. These efforts may include, but are not limited to, the following:

- Attending design assistance meetings,
- Reviewing EEMs,
- Calculating incremental costs of EEMs,
- Assisting with energy simulation analyses (Certification path only),

³ Rocky Mountain Power must not already have a signed Letter of Intent or New Construction Design Assistance Application/Agreement for the project.

- Supporting and promoting the EEMs during design and value engineering,
- Submitting CDs for review, and
- Completing other tasks directly related to the program.

The design team reimbursement is a fixed value based on the square footage of the project. A summary of the incentive levels as a function of the project size is shown in Table 1⁴.

Table 1. Design Team Reimbursement

Project Size (SF)	Design Team Reimbursement
<20,000	\$4,000
20,000-49,999	\$6,000
50,000-99,999	\$8,000
100,000-399,999	\$10,000
400,000 +	\$12,000

If the project encompasses several buildings (e.g., a retail shopping center or more than one office building), the design team reimbursement is based on the total combined square footage of the buildings.

The design team reimbursement payment is provided after the energy consultant's review of the CDs. If the design team has incorporated measures into the CDs that provide savings beyond the energy savings threshold (exceed state energy code by at least 10% on a whole building electric basis), the design team reimbursement is paid per the terms of the design team reimbursement agreement. Payment is provided to one entity (architect, engineer, etc.). It is the design team's responsibility to determine any disbursement of monies between the various parties.

Design Team Reimbursement Example:

Office Building Campus (3 Buildings):

- Office Building A: 50,000 SF
- Office Building B: 75,000 SF
- Office Building C: 20,000 SF

Combined Project Size: 145,000 SF
Total Incentive: \$10,000

3.3 Core and Shell/Tenant Improvement Projects

Core and shell (C&S) and tenant improvement (TI) projects typically result from an owner who is constructing a building with the purpose to lease out the floor area. In some cases, the building may contain mixed used occupancy (e.g., retail on the first

⁴ The project is as the owner defines it by how the contract for design is set up. For example, if the owner contracted for design for each separate building, then each building is considered one project.

floor and office space on the upper floors). Measures that are typically included under C&S from those that are in TI are summarized in Table 2.

Table 2. EEMs for C&S & TI Projects

Typical C&S Measures	Typical TI measures
Building Envelope (walls, roof, floor, glazing)	Tenant Area Lighting
Common Area/Exterior Lighting	Tenant Area Daylighting Controls
Common Area Daylighting Controls	VAV Box Measures (if they are not installed as part of the C&S scope)
Central Plant Measures	Data Center Measures
Air Handling Equipment Measures	

Typically, during the design phase of the new C&S building, tenants have not been secured for all spaces, and therefore, the TI design has not been completed yet. For the purposes of the program and design team and owner incentives, credit towards the 10% energy savings threshold can only be given for systems that are designed, installed and commissioned as part of the project.

Final project savings and incentives will be based on the loading and system operation documented during the commissioning and final inspection phases of the project. C&S projects may be required to wait until occupancy or other TI activities are complete in order to receive the full project incentive. If the project is unable to achieve 10% energy savings above code, Rocky Mountain Power may consider providing incentives through another program offering.

4.1 PROJECT APPLICATION/AGREEMENT

The first step in participating in the program is to complete a project Application/Agreement for services. The Application/Agreement contains information about the anticipated facility's design goals, building characteristics, and owner and design team contact information. Based upon Rocky Mountain Power's review of the form, the project can be expedited to the most appropriate incentive program offering or New Construction path. In some cases, there may be a preliminary meeting to review the application and discuss program options and how a project is "tracked" once a program option is selected. A sample of the Application/Agreement is provided in Appendix B.

Measures within projects participating in the New Construction Design Assistance Program are not eligible to receive incentives through the other program offerings. However, if a point is reached during the project (e.g., during late design or early construction) where the 10% energy savings above code cannot be achieved, Rocky Mountain Power may consider providing incentives through another program offering.

4.2 NEW CONSTRUCTION DESIGN ASSISTANCE PATHS

Within the Energy FinAnswer *New Construction Design Assistance* offering, there are two paths for design teams and owners constructing highly efficient buildings.

- The *design assistance path* provides utility-paid consulting services for the owner and design team to serve as a resource for facilitating integrated design. See Section 4.2.1.
- The *certification path* allows customers who have the energy simulation resources in-hand to pursue high-efficiency design and submit it to the program upon completion of their design. See Section 4.2.2.

Both paths provide equal owner incentive levels while providing flexibility to the design teams to utilize the program resources that best meet their needs. An illustration of these paths is shown in Figure 2 and described below.

New Construction Design Assistance Process

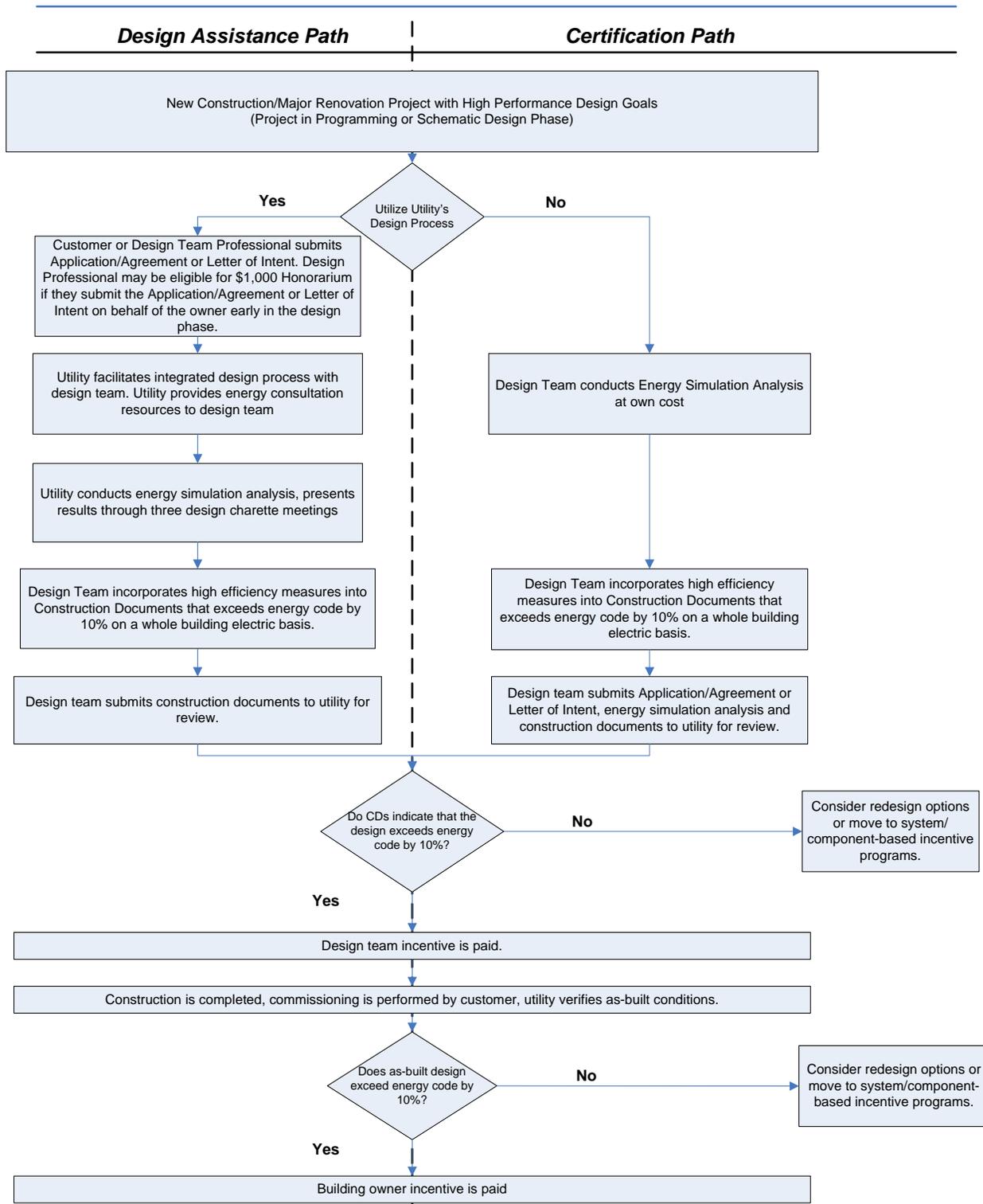


Figure 2. Design Assistance Program Paths

4.2.1 Design Assistance Path

Providing quality information in a timely fashion is critical to incorporating EEMs into buildings. To aid design teams with information throughout the design process, the Design Assistance path offers utility-funded energy analysis services to the design team and owner. The process commences with a meeting to brainstorm and identify potential EEMs and is followed by an investment-grade energy analysis report that quantifies the economic impacts of each measure. The process is completed with a review of the construction documents to ensure that the EEMs are included in the final design and an inspection of the as-built building to confirm the EEM's were implemented correctly. Detailed information about the energy consultant selection and the three-meeting design assistance process is contained in the following sections.

4.2.1.1 Technical Consultant Selection

Rocky Mountain Power maintains a list of qualified energy engineering firms, and Rocky Mountain Power will designate a consultant from this list to serve as the energy analyst for the process.

If a design team has an energy consultant on the project team that is not currently part of the pool of consultants under contract to Rocky Mountain Power, the energy consultant may contact Rocky Mountain Power to be included in a solicitation for consultants for future projects.

4.2.1.2 Meeting 1: Scoping meeting

The scoping meeting is the official “kick-off” of the process. The meeting includes representatives of the owner, architects, engineers, utility and sometimes the developer and contractor(s), along with the facilitator. At this meeting, the schedule is established, programming is discussed, the schematic design of the building is reviewed and a list of potential EEMs is discussed.

The scoping meeting also provides an opportunity for the design team and owner to discuss the scope of the utility-funded analysis. At this meeting (or in meeting follow-up communications), the owner and design team agree on what EEM packages the energy consultant will model for the initial scoping report.

If the customer desires additional services from the consultant, they may contract separately for those items (e.g. LEED certification, non-electric fuel analysis).

4.2.1.3 Meeting 2: Schematic Design Meeting

Upon completion of the initial analysis, the design team is presented with results of the energy savings for a number of viable EEMs. Using costs provided by the design team, simple payback information for each individual strategy is presented. The design team is then challenged to weigh the value of the strategies and group them into a package called a “design bundle”. The strategies within the design bundle are then incorporated into the model for detailed analysis.

The packaged approach provides significant benefit over evaluating each measure individually. The goal is to treat the building as a functionally integrated structure rather than a base building with “add-on” efficient systems. By combining the strategies into a design package, the influence of trade-offs and interactions between systems can be appropriately evaluated. It is very important to note that individual results are not always 100% additive; two strategies that save 2% alone, may not save 4% combined. Considering the interactive effects of strategies when working together, the integrated system may save 3 to 3.5%

4.2.1.4 Meeting 3: Design Development Meeting

After agreement on the design alternatives is reached, the energy consultant will revise the energy simulation models. In the third meeting, Rocky Mountain Power will present an Energy Analysis Report (EAR) that details the economic impacts and potential incentives for the design bundle. The EAR will also provide a commissioning plan for the owner to complete upon the building’s completion. The plan outlines functional testing requirements as well as trending parameters to ensure that the systems, when installed, operate as intended.

During the meeting, the team reviews the results of the design bundle. This meeting also includes the presentation of an incentive agreement that details the terms in which an incentive will be paid. *It is imperative that the Incentive Agreement be signed prior to purchasing equipment.*

4.2.1.5 Construction Document Review

After the design alternative has been selected and incorporated into the CDs, the design team is responsible for providing the energy consultant with the complete 100% CD package. The energy consultant will review the documents and check the specifications to ensure the selected design alternatives are included and identified as intended. If some measures of the final design alternative selection have been overlooked, efforts will be made to encourage the design team to incorporate them at this point. If these efforts prove unsuccessful, the savings estimates and corresponding incentive levels will be reduced accordingly. At this point, if the design team has incorporated measures

that provide savings beyond the 10% energy savings threshold, the design team reimbursement is provided.

4.2.1.6 Commissioning

For purposes of this program, commissioning includes verification the installed EEMs are operating as modeled. This ensures that the predicted energy savings are being achieved and that the system's operation and performance has been optimized. In the energy analysis report, Rocky Mountain Power will provide a commissioning plan for the owner to complete once the building is constructed and all systems operational. The plan outlines functional testing requirements as well as trending parameters to ensure the systems operate as intended. Commissioning is required to receive a full incentive.

Commissioning is the responsibility of the building owner and can be completed by internal staff, contracting with the installing contractor, or contracting with Rocky Mountain Power's energy consulting firm.

Commissioning is required to be completed when the building is fully occupied and when the system's operation can be verified. Some measures may require operation during the cooling or heating seasons.

A sample Commissioning Report is provided in Appendix F.

4.2.1.7 Final Inspection

Upon review of the Commissioning Report, Rocky Mountain will evaluate any variations found for each strategy as compared to its expected functionality, characteristics, and scope of installation. If variations are found for specific strategies, the energy simulation model is refined to match the functionality, characteristics and/or scope of the verified strategies. The as-built model is then used to calculate the final energy impacts. The final inspection report is issued to the design team and the building owner as the final step in the design assistance process. The building owner incentive is paid based on savings results confirmed in the final inspection report and per the terms of the incentive agreement. Rocky Mountain Power pays for the final inspection report.

4.2.2 Certification Path

The *Certification path* is aimed at providing customers with an option to participate in the New Construction Design Assistance program with high efficiency designs, while allowing them the flexibility to utilize their own resources in lieu of Rocky Mountain Power's design assistance services. Through this path, the customer is responsible for designing their building to exceed the 10% energy performance threshold as well as contracting and funding the energy simulation analysis.

4.2.2.1 Construction Document and Simulation Model Review

After the energy savings design alternatives have been analyzed by the design team (at the owner's cost) and incorporated into the CDs, the design team is responsible for providing Rocky Mountain Power with a completed Project Application/Agreement, the 100% CD package, and the energy simulation model. *For energy simulation requirements for the Certification path, see Appendix E.*

Rocky Mountain Power will review that the specifications for each measure are included in the CDs. Similarly, Rocky Mountain Power will review the energy simulation model to ensure the selected design alternatives and associated energy savings are calculated in accordance with program requirements. Rocky Mountain Power will provide a Construction Document Review Report to the building owner and design team summarizing their review of the simulation model, the anticipated electric savings impacts, and any eligible incentive amounts. The report will include a commissioning plan for the owner to complete once the building is constructed and all systems operational. The plan outlines functional testing requirements as well as trending parameters to ensure that the systems, when installed, operate as intended. If some measures of the final design do not meet program requirements or the simulation model needs to be modified, efforts will be made to encourage the design team to reconcile them at this point.

If the design qualifies for the program and the building owner decides to pursue the incentives, Rocky Mountain Power will provide an incentive agreement to the building owner that details the terms in which an incentive can be paid. ***It is imperative that the Incentive Agreement be signed prior to purchasing equipment.***

Additionally, if the design exceeds the energy savings threshold, the design team reimbursement agreement will also be provided to the design team contact as provided on the Project Application/Agreement.

4.2.2.2 Commissioning

For purposes of this program, commissioning includes verification the installed EEMs are operating as modeled. This ensures that the predicted energy savings are being achieved and that the system's operation and performance has been optimized. In the energy analysis report, Rocky Mountain Power will provide a commissioning plan for the owner to complete once the building is constructed and all systems operational. The plan outlines functional testing requirements as well as trending parameters to ensure the systems operate as intended. Commissioning is required to receive a full incentive.

Commissioning is the responsibility of the building owner and can be completed by internal staff, contracting with the installing contractor, or contracting with Rocky Mountain Power's energy consulting firm.

Commissioning is required to be completed when the building is fully occupied and when the system's operation can be verified. Some measures may require operation during the cooling or heating seasons.

A sample Commissioning Report is provided in Appendix F.

4.2.2.3 Final Inspection

Upon review of the Commissioning Report, Rocky Mountain will evaluate any variations found for each strategy as compared to its expected functionality, characteristics, and scope of installation. If variations are found for specific strategies, the energy simulation model is refined to match the functionality, characteristics and/or scope of the verified strategies. The as-built model is then used to calculate the final energy impacts. The final inspection report is issued to the design team and the building owner as the final step in the design assistance process. The building owner incentive is paid based on savings results confirmed in the final inspection report and per the terms of the incentive agreement. Rocky Mountain Power pays for the final inspection report.

4.3 TIMELINES AND MILESTONES

Figure 3 and Figure 4 outline the milestones and timeline for each project phase as they relate to each path:

Milestone	Project Phase					
	Programming	Schematic Design	Design Development	Construction Documents	Construction	Acceptance
Complete Project Information Form/Submit Design Professional Honorarium	★					
Scoping Meeting	★					
Develop Baseline Model						
Evaluate EEMs/Economics						
Pay Design Professional Honorarium (if applicable)						
Schematic Design Meeting			★			
Develop Bundle Models						
Develop Report						
QC Process/Final Report Draft						
Design Development Meeting				★		
Construction Document Review					★	
Design Team Reimbursement						\$
Commissioning						
Final Inspection						★
Pay Owner Incentives						\$

Figure 3. Timelines and Milestones for Energy Design Assistance path

Milestone	Project Phase					
	Programming	Schematic Design	Design Development	Construction Documents	Construction	Acceptance
Complete Project Information Form				★		
Construction Document/Energy Model Review				★		
Design Team Reimbursement						\$
Commissioning						
Final Inspection						★
Pay Owner Incentives						\$

Figure 4. Timelines and Milestones for Certification path

4.4 DESIGN TEAM ROLES AND RESPONSIBILITIES

To better understand the roles and responsibilities of each member of the process, a suggested list is provided below. The following list summarizes each team member's role:

- **Design Team (Architect/Mechanical Engineer/Electrical Engineer)**
 - Complete Project Application/Agreement (in conjunction with building owner)
 - Sign design team reimbursement agreement
 - Provide schedule guidance
 - Provide tentative milestone dates and deliverables to help align the assistance provided by Rocky Mountain Power
 - Participate in design assistance process
 - Attend meetings
 - Provide building design documentation when it is available
 - Evaluate suggestions provided during the process
 - Provide required inputs for the energy savings and economic analysis
 - Communicate basis of design to energy consultant
 - Discuss the goals of the team and owner to minimize energy use and what energized systems and controls are acceptable to the owner.
 - Guidance with EEM selection
 - Provide EEM Incremental costs – incremental costs are the difference between the installed cost of a code compliant measure and the installed cost of the proposed measure that exceeds code.
 - Provide final construction documents
- **Building Owner**
 - Complete Project Application/Agreement (in conjunction with design team)
 - Guidance with EEM selection
 - Support the design team with EEM selection and budget
 - Provide EEM Incremental costs – incremental costs are the difference between the installed cost of a code compliant measure and the installed cost of the proposed measure that exceeds code.
 - Sign incentive agreement
 - Commissioning (i.e., fine tune the systems and verify installed savings of EEMs)
- **Rocky Mountain Power (account manager, project manager, and/or energy consultant hired by Rocky Mountain Power)**
 - Facilitate the Design Assistance or Certification process

- Provide design reviews and subsequent report of the CD drawings to ensure EEMs have been implemented in the design
- Provide funding for the building owner incentives, design team honorarium and reimbursement, design assistance and report efforts

Table 3 summarizes the roles and responsibilities.

Table 3. Roles and Responsibilities

Item	Owner	Architect	Engineers	Rocky Mountain Power
Complete Project Application/Agreement	✓	✓	✓	
Attend Three Meetings <i>(Design Assistance path)</i>	✓	✓	✓	✓
Provide Basis of Design	✓	✓	✓	
Provide Cost Documentation	✓	✓	✓	
Guide the EEM Selection	✓	✓	✓	✓
Sign incentive agreement	✓			✓
Sign design team reimbursement agreement		✓	✓	
Conduct Commissioning	✓			
Conduct energy simulation analysis <i>(Design Assistance path)</i>				✓
Conduct energy simulation analysis <i>(Certification path)</i>	✓			
Provide final construction documents	✓	✓	✓	
Conduct CD Review				✓
Provide Owner & Design Team Incentives				✓

In addition to the *New Construction Design Assistance* program described in this manual, Rocky Mountain Power offers several other program options to help commercial, industrial, and agricultural customers to save energy and money. A brief explanation of each of these programs is provided below.

- Energy FinAnswer (energy analysis)– This program is geared to help customers interested in retrofit or new construction/major renovation projects not participating in the Design Assistance program. Rocky Mountain Power provides investment-grade energy engineering to identify and quantify EEMs and incentives for energy-efficient heating and cooling systems, lighting, envelope, compressed air systems, refrigeration systems, pumping systems and more.

Examples of projects that can participate in Energy FinAnswer include:

- new construction/major renovation projects that do not fit the *New Construction Design Assistance* program (such as industrial or other projects involving systems where energy code does not apply or where the whole building will not exceed energy code by at least 10%) and
- retrofit projects.

Technical services for these Energy FinAnswer projects are focused on electric systems/measures rather than the whole building. Customer incentives are calculated identically to the Design Assistance program; incentive caps may apply and design team incentives are more limited. For more information on Energy FinAnswer services and incentives not described in this manual, please refer to the program Web site or contact us.

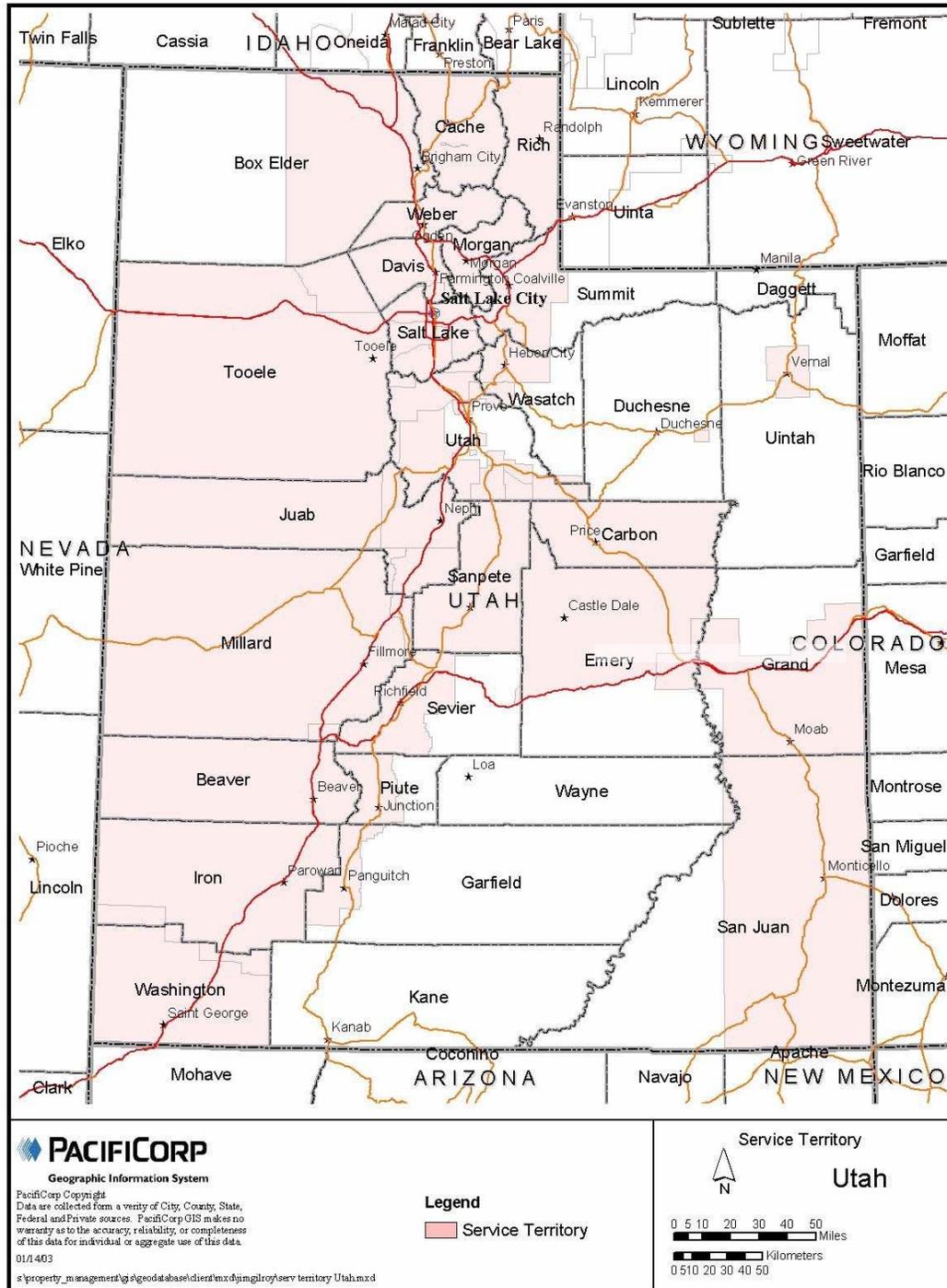
- FinAnswer Express – This program offers prescriptive cash incentives for common retrofit and new construction EEMs related to high efficiency lighting, premium efficiency motors, high efficiency HVAC, variable frequency drives for HVAC fans and pumps, cool roofs, chillers, programmable thermostats, and other energy efficient equipment. The streamlined customer participation process is intended for customers with straightforward projects, and the customer can choose a vendor or request an independent consultant for technical expertise.
- Self-Direction Credit – This program provides large business customers whose electrical needs exceed 5,000,000 kWh or 1,000 kW in the prior twelve months, the opportunity to receive credits to offset the Customer Efficiency Services charge for qualified energy efficiency projects. New construction projects are eligible if the projected usage of the facility is anticipated to meet the usage

requirements above. Eligible customers must self-fund the energy engineering and implementation of energy efficiency projects at their facilities.

- **Recommissioning** - This program is designed to achieve demand and energy savings in existing commercial and industrial facilities through the systematic evaluation of facility systems and implementation of cost-effective measures targeted to improve facility operation. Program participants are commercial and industrial facility owners who have a demonstrated commitment to spend \$10,000 to implement identified recommissioning measures with an estimated simple payback of one year or less.

For more information about these programs provided by Rocky Mountain Power within Utah, please visit www.rockymountainpower.net/utsave.

Appendix A Rocky Mountain Power Service Area Map for Utah



The following list contains cities which are not served by Rocky Mountain Power in Utah. Municipal coverage can vary and it is important to confirm the electric utility service provider.

- Beaver City
- Blanding City
- City of Bountiful
- Brigham City
- The Town of Eagle Mountain
- City of Enterprise
- Ephraim City
- Fairview City
- Fillmore City
- Heber City
- Hildale City
- Holden Town
- Hurricane City
- Hyrum City
- Kanosh Town
- Kaysville City
- Lehi City
- Logan City
- Meadow Town
- Monroe City
- Morgan City
- Mt. Pleasant City
- Murray City
- Oak City
- Town of Paragonah
- Parowan City
- Payson City
- Price City
- City of Santa Clara
- Spring City
- City of St. George
- Springville City
- Washington City

Appendix C Design Team Reimbursement Agreement

Appendix E Certification Path Energy Simulation Requirements

STATE-SPECIFIC CODE REFERENCES

Utah Energy Code follows the IECC 2006. There may be instances where the building owner and design teams want to use ASHRAE 90.1-2004; however, this program has been established to follow IECC 2006 for minimum efficiencies and performance values. This program also uses the modeling guidelines provided in Section G2 of the Informative Appendix G of ASHRAE Standard 90.1-2004 (including addendum's).

ENERGY SIMULATION PROGRAM SELECTION

Any eligible energy efficiency measure that can reduce electric energy usage of a building from the approved baseline can be considered an EEM. These items are typically related to the envelope, mechanical, electrical, and building controls systems.

Building energy simulation programs utilized for each project is required to be consistent with the guidelines provided in Section G2 of the Informative Appendix G of ASHRAE Standard 90.1-2004 (including addendum's).

If the selected energy simulation program cannot explicitly model an EEM, a thermodynamically similar component model that can approximate the expected performance may be used.

BASELINE DEFINITION

The baseline energy model for the purposes of the design assistance program follows the modeling guidelines set forth in ASHRAE 90.1-2004 Informative Appendix G (including addendum's) and the minimum equipment efficiency requirements from Utah Energy code (IECC 2006) or industry standard practice, where code does not apply. Only energy savings achieved above this baseline level will be eligible to receive incentives assuming that energy savings attributed to the as-built design exceed code by 10%. If the as-built design does not exceed code by 10%, no incentives will be provided. This concept is illustrated in following figure.

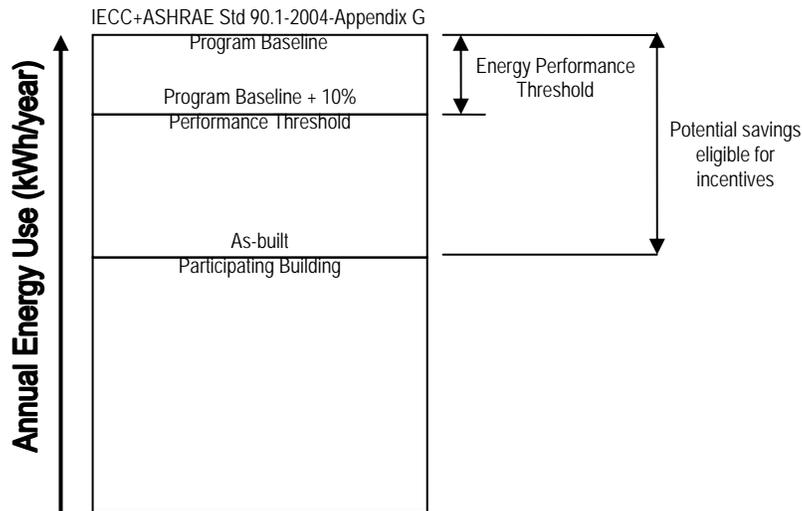


Illustration of program baseline and savings eligibility

This strategy provides a consistent benchmark against which to compare energy performance metrics and energy savings for subsequent energy strategy alternatives. All building parameters for the baseline model will be set to the minimum performance requirements of IECC 2006, based on the most current architectural and engineering design and operation schedule of the project available at the schematic design phase.

The following modeling guidelines (including addendums) that are to be followed in the Appendix G, ASHRAE Standard 90.1-2004 include, but are not limited to:

- Modeling requirements for each of the sections noted in Table G3.1
 - Design model
 - Additions and alteration
 - Space use classification
 - Schedules
 - Building envelope
 - Lighting
 - Thermal blocks
 - HVAC systems
 - Receptacle and other loads
 - Modeling limitations to the simulation program
- HVAC Modeling Guidelines (Sections G3.1.1, G3.1.2, G3.1.3)
 - Baseline HVAC system selection
 - Equipment capacities

- Sizing runs
- Fan system operation
- Economizer controls
- Design airflow rates
- Supply/return fan power
- Exhaust air energy recovery
- Heat pump controls
- Hot water pump size and controls
- Chilled water system (chiller and chilled water pumps) size and controls
- Heat rejection (cooling tower and condenser water pumps) size and controls
- Supply air temperature reset
- VAV minimum airflows
- Fan power
- VAV fan part load performance

The following performance guidelines in IECC 2006 shall be followed after determining the baseline systems in ASHRAE 90.1-2004:

- Building envelope requirements (Section 502.1)
- Building mechanical systems' performance guidelines (Section 503.1)
- Electric power and lighting systems performance guidelines (Section 505)

Baseline Modeling Items Typically Overlooked

A few critical items, which are noted above, that tend to be overlooked in building a baseline model per Appendix G include:

- appropriate fan sizing
- calculating the baseline power usage of the fans and pumps
- separating out the fan and compressor energy component of the EER and COP for packaged HVAC and heat pumps systems
- averaging the energy use of the building in 4 directions to represent baseline energy use
- wall/roof thermal performances including thermal bridging
- total fenestration assembly U-values including the frame
- baseline window percentages per ASHRAE (e.g., 40% windows by window to wall area are the maximum allowed in the baseline)

CALCULATION METHODOLOGIES

For the certification path, the owner is responsible for providing an interactive model of the proposed facility and the baseline facility. To properly portray the impacts of each measure within the interactive model, the order in which the EEMs shall be modeled based on the EEM type shall start with measures that affect the building loads, then systems, and conclude with EEMs that affect the plant. The following table shows an example of the types of EEMs and their hierarchy in determining the energy modeling order, which was discussed in the prior section.

Example EEMs and Modeling Order

	Loads	Systems	Plant
EEMs	Envelope Measures	PE Motors	Chiller Plant
	Cool Roof	Air Handler VFDs	Plant Controls
	Lighting/ Plug Loads	Air Handler Controls	Pumping Arrangements
	Lighting/Equipment Controls		Cooling Tower VFD

In an effort to streamline the modeling process, any available parametric run feature shall be used to model the EEMs. In cases where the EEM cannot be modeled using a parametric run, multiple models may need to be created. The modeling results that are presented for each of the chosen EEMs in the summary tables must total the combined interactive effects off all the EEMs. This shall be accomplished by having a “rolling baseline” that each EEM model is based on the previous EEM, until all of the proposed EEMs have been modeled. For example, EEM 1 shall be based on the baseline model (average of the four rotations); EEM 2 shall be based on EEM 1, and so forth.

In addition, if the size of the air handler fans and pumps are different in the baseline model sizing run, compared to the actual design, the actual air handler fan and pump sizes shall be incorporated in all EEM models. Note: measure savings should be defined such that one can add savings for each measure and arrive at the project total savings (no interactive savings line item). Any discrepancies between the baseline and design equipment sizes shall be noted in the documentation provided to Rocky Mountain Power.

For systems that are not covered by code, the baseline is industry standard practice. The energy simulation model can be used to perform the analysis. However, if the simulation tool is not able to perform the analysis, a thermodynamically similar model that takes into account loads, schedules, equipment sizes, efficiencies, and part load efficiencies shall be used in its place. These savings shall be reported as a separate line item in the results tables. However, the baseline use and savings for non-code compliant EEMs shall not be included as part of the total energy savings to exceed code by 10% electricity (kWh) savings.

ESTIMATING MEASURE COSTS

Customer decisions and project cost-effectiveness are based upon accurate costs recorded for each measure. EEM costs shall be provided by the building owner for each measure. Cost data shall be the incremental cost between code level equipment and the proposed EEM equipment. Sometimes, it can be assumed that the labor costs will be the same for the baseline and EEM in which case the difference in material costs is sufficient.

New construction: A newly constructed facility or newly constructed square footage added to an existing facility.

Major renovation: A change in facility use type or where the existing system will not meet owner/customer projected requirements within existing square footage.

Retrofit: Changes, modifications or additions to systems or equipment in existing facility square footage.

Typical Acronyms and Definitions:

Design/Construction Process (Typical Commercial Construction)	
Programming	First construction phase to discuss building concept/use, basis of design, and owner objectives (2 month process)
SD	Schematic Design Development - assembly preliminary floor plans, elevations, types of mechanical and electrical system to be considered (3 month process)
DD	Design Development - finalize building zoning, design and size building systems, and select equipment (3 month process)
CD	Construction Document Development - continue to add details to design and finalize (4 month process)
Bidding	CDs are present to bidders and bids are accepted for selection (1 month)
Construction	Building is constructed and commissioned (9 months)
Acceptance	Building is turned over to owner and final punch list items are closed out. (2 months)
Units	
ACH	Air changes per hours - measurement of building air infiltration
BTU/H	British Thermal Units per Hour - energy that is produced or rejected from a system
°C	Degree Celsius - measure of temperature in the International System (SI)
CF	Cubic feet - measure of volume
CFM	Cubic feet per minute - measurement of airflow
°F	Degree Fahrenheit - measure of temperature in the US Customary System)
fc	Foot-candles (lumens/ft ²) - measure of lighting illuminance
FPM	Feet per minute - measurement of air velocity
ft ²	Square feet - measure of area
GPM	Gallons per minute - measurement of fluid flow
kBtu	One thousand British Thermal Units

kW	Kilowatt - (1,000 Watts) unit of measurement for electrical demand
kWh	One thousand (k) watt-hours - electricity use over a period of time
LED	Light Emitting Diode - type of lamp
LPD	Lighting power density (W/ft ²) - lighting power use per area
MWh	One million (M) watt-hours - electricity use over a period of time
RH	Relative humidity - measurement of the moisture in the air
SF	Square feet - measure of area
W/ft ²	Watt per square foot - energy use (lighting/plug loads) per floor area
Wk	Week (s)
Yr	Year (s)
General	
AHU	Air Handling Unit
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
CFL	Compact Fluorescent Lamp - type of fluorescent lamp
CV	Constant Volume
Cx	Commissioning
DOE	Department of Energy
DX	Direct Expansion - refers to the thermodynamic process in most refrigeration system
ECM	Electronically Commutated Motor
EEM	Energy Efficiency Measure
EPACT	Energy Policy Act
eQUEST	A Quick Energy Simulation Tool
EUI	Energy Use Index - annual energy use per square foot of floor area)
HID	High Intensity Discharge - family of lamps
HPS	High Pressure Sodium - type of HID lamp
HVAC	Heating, Ventilation, and Air-conditioning
IDEC	Indirect/Direct Evaporative Cooling
IECC	International Energy Conservation Code
MH	Metal Halide - type of HID lamp
M&V	Measurement and verification
O&M	Operation and Maintenance
Pckgd	Packaged - DX rooftop unit
RCx	Recommissioning
RTU	Roof-top Unit
T12/T8/T5	The diameter of a fluorescent lamps in eighths' of an inch (commons types of fluorescent lighting)
VAV	Variable Air Volume
VFD	Variable Frequency Drive

Rocky Mountain Power

Utah Program Web page	www.rockymountainpower.net/utsave
Design Professional Web page	www.rockymountainpower.net/designprofessional
Contact Phone	1-800-222-4335 or your account manager
Contact Email	energy.expert@PacifiCorp.com
Fax	1-503-813-5230

Other Utah Resources

Utah Energy Conservation Coalition: www.utahenergy.org/energy_codes.html

American Institute of Architects: www.aiautah.org

Utah American Society of Heating Refrigeration Air Conditioning Engineers (ASHRAE): www.utahashrae.org

Utah Illuminating Engineering Society of North America (IESNA): <http://iesnautah.org/>

U.S. Green Building Council: www.usgbc.org

Energy Design Resources: www.energydesignresources.com

Better Bricks: www.betterbricks.com

Lighting Design Lab: www.lightingdesignlab.com

Appendix I Questions

Frequently Asked

Q: What happens if my project cannot achieve the 10% savings threshold?

A: The project will be transferred to the prescriptive program or the Energy FinAnswer standard path. If the construction documents do not achieve the 10% target, the design team reimbursement will also be forfeited. However, if a design team honorarium has been paid, the designer will not be asked to repay that amount.

Q: Are there any examples of anomalies with the Appendix G baseline selection?

A: Design teams may opt to install air-cooled chilled water systems for buildings which require a packaged DX VAV system baseline. In this particular case, the overall energy consumption of the proposed high efficiency air cooled chiller combined with the additional chilled water pumping energy exceeds the baseline mechanical system's energy consumption. In these instances the energy consultant may need to recommend that the design team pursue a water cooled chilled water plant or install a high efficiency packaged VAV system that exceeds code.

Q: What types of facilities are eligible to participate in New Construction Design Assistance?

A: Facilities where the majority of the systems are subject to Utah Energy Code would be eligible for design team reimbursement and building owner incentives through the New Construction Design Assistance Program. Facilities that are primarily composed of non-code compliant systems are not eligible for building owner or design team reimbursement incentives through the New Construction Design Assistance Program. However, the project is eligible for incentives and technical assistance through Energy FinAnswer or FinAnswer Express.

Q: How would a facility which has both code and non-code compliant systems participate under Rocky Mountain Power's programs?

A: The code compliant measures such as HVAC, envelope, building controls, and lighting would be eligible for participation in the New Construction Design Assistance Program. Measures which are not subject to Utah Energy Code (refrigeration, computer room cooling, etc) would be routed through the Energy FinAnswer or FinAnswer Express programs. The baseline energy consumption for non-code compliant systems is based upon industry standard practice. Efforts will be made to provide technical assistance and incentives for all eligible measures by Rocky Mountain Power. For more information please contact us.