



CHARETTE REPORT FOR THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY MARINE OPERATIONS CENTER

BOATHOUSE RENOVATION PROJECT

NOAA'S OFFICE OF NATIONAL MARINE SANCTUARIES

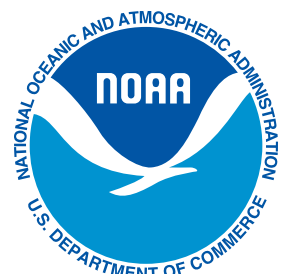
BLACK AND VEATCH SPECIAL PROJECTS CORP.
WITH FACILITY PROGRAMMING AND CONSULTING
FINAL, NOVEMBER 2010



NATIONAL MARINE
SANCTUARIES



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Facility Programming and Consulting, part of the Black and Veatch Special Projects Corp. team, has prepared this charrette report for the Stellwagen Bank National Marine Sanctuary Marine Operations Center project in Scituate, MA.

This report is intended to re-validate the initial feasibility and programming effort for the Marine Operations Center completed by Fraser and Fogle Architects and confirms the preliminary design and development proposals on the boathouse renovation.

FOREWORD



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*The contents of this document are not for regulatory approval, permitting, or construction.
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TABLE OF CONTENTS

Introduction.....	1
Executive Summary.....	2
Charrette Analysis.....	3
Space and Adjacency Requirements	4
Supporting Requirements	5

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Introduction

1

NOAA's Office of National Marine Sanctuaries (ONMS) has commissioned a planning charrette and an associated report on the renovation of the iconic boathouse structure at the Stellwagen Bank National Marine Sanctuary's (SBNMS) campus in Scituate, MA. The collaborative charrette engaged a working group of stakeholders involved in the project to re-validate preliminary programming decisions made by SBNMS during the July 2010 Boathouse Renovation Feasibility Study.

The renovation of the boathouse and pier at SBNMS will create a Marine Operations Center (MOC) to support the sanctuary mission and extend the capabilities of the site. The Boathouse is part of a property transferred from the Coast Guard to NOAA in 2000, which includes the main administrative building, the annex conference building (formerly a garage), an oil storage shed, the pier, and the boathouse. A major renovation of the administrative and meeting annex facilities was completed in 2004.



*The SBNMS boathouse and pier
(Source: SBNMS)*

Currently, the 3,565-square-foot, two-story boathouse is used for storage and boat repairs, but does not support the sanctuary effectively due to deteriorated conditions and lack of utilities. The boathouse is built on pilings over the water and includes a 300-foot pier with two floating docks attached. The docks have the capacity to berth one 50-foot-plus vessel and three smaller boats simultaneously. The project scope includes renovations to the boathouse and an additional parking lot on an adjacent property to support the renovated boathouse and the meeting annex building, the latter of which is used frequently by both the sanctuary and the community.

The goal of the renovation is to support in-house research, operations, and outreach by creating flexible spaces that will promote the broad mission of the sanctuary. The boathouse renovation will accommodate immediate needs of the sanctuary, including a flexible workroom, lab space, a boat repair shop, and visitor accommodations. The MOC will support the sanctuary mission established in the most recent SBNMS Management Plan:

To conserve, protect and enhance the biological diversity, ecological integrity and cultural legacy of the sanctuary while facilitating compatible use.

NOAA's Office of National Marine Sanctuaries Vision

The vision of ONMS is to inspire people through education, research, public outreach, ocean exploration, and marine management to value marine sanctuaries as treasured places today and for generations ahead.

INTRODUCTION

NOAA's Office of National Marine Sanctuaries Mission

It is the mission of the National Marine Sanctuary System (NMSS) to protect, conserve, and enhance the living and non-living resources of the ocean for this and future generations.

Purpose of This Document

The purpose of this report is to support the overall boathouse renovation project and document the planning charrette conducted on September 14, 2010. The results of the charrette are not intended to represent the final outcome of the planning process for the boathouse, but rather a step in the overall process. This report documents the results of the charrette and is a tool to assist in the review and analysis of the ideas and concepts that evolved during the planning charrette. These concepts will be shaped into a specific schematic plan for the boathouse based on input from the key stakeholders.

This report provides a summary of design concepts and issues related to the renovation of the boathouse. Over the course of the next several months, these preliminary concepts will be developed into a refined design concept and construction plan.

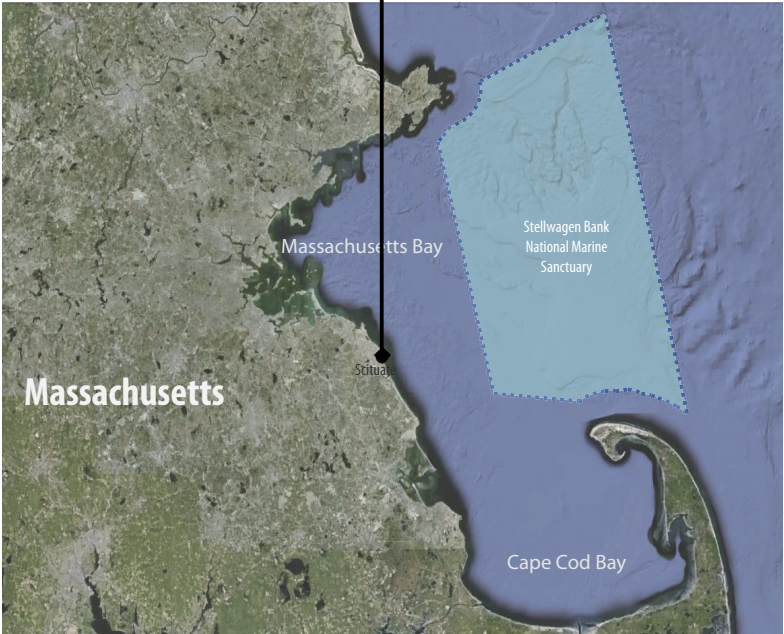
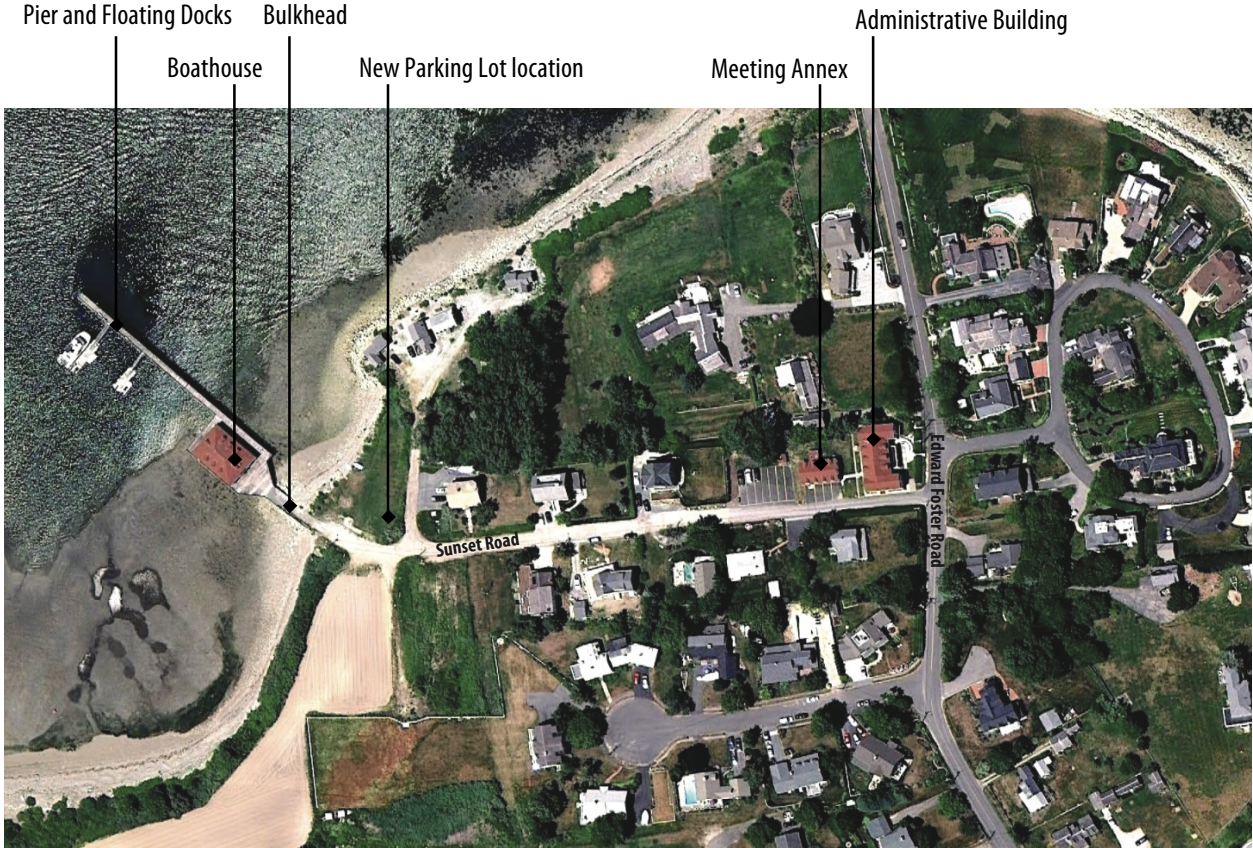
It should be noted that the boathouse building is not eligible for inclusion on the historic register as determined by the Massachusetts Historical Commission because of significant structural changes made to the building, including the removal of marine rails and large rolling doors on the building's north side.



Significant structural changes to the campus buildings, including the removal of the marine railways, have contributed to the SBNMS facilities no longer being considered historic buildings under the Massachusetts Historical Commission. (Source: ONMS)

Project Location

The boathouse project is located near the SBNMS in Scituate, MA.



Project Process

The following information gathering and planning process has lead up to the MOC project.

Preliminary Information Collection. The intent of this task was to gather as much preliminary information as possible in order to develop the initial parameters for the project and prepare a preliminary building program. This phase of the project determined the vision for the boathouse renovation project.

Feasibility Study. The feasibility study completed in July 2010 determined the preliminary project scope, program, and cost. The document evaluates the current facility conditions and infrastructure, projected boathouse space requirements and investigates the option to renovate the facility. Data was collected by review of previous reports, field investigation, interviews with facility personnel, and review of existing facility drawings and reports. Conceptual layouts are provided in the report for a renovated facility fulfilling the program needs.

- **Reference Documents.** Two documents were produced prior to the September 2010 Planning Charrette Workshop:
 - *Feasibility Study for the Boathouse Renovation*, Fraser and Fogle Architects, July 2010
 - *Waterfront Inspection at Stellwagen Bank National Marine Sanctuary Boathouse Pier*, Appledore Marine Engineering, Inc., October 2008

Planning Charrette Workshop and Report. The charrette process began with a meeting to review detailed requirements for each space in the MOC, which included NOAA project managers and engineers, project design architects and engineers, SBNMS staff, and programming consultants. The group then toured the SBNMS campus and buildings, including the boathouse and pier to get a better understanding of the building and its constraints. The planning charrette was held in the afternoon with ONMS headquarters representatives and SBNMS staff in attendance. The intent of the charrette was to re-validate the feasibility study findings and preliminary building program, along with the development of detailed room requirements for each space included in the renovation. The charrette report and detailed programming of the boathouse renovation will be reviewed and approved by NOS and NOAA project management and guide the design development of the project.

After the charrette report is finalized and issued, the design team will move forward with detailed planning and construction documents for the renovation project.

Executive Summary

2

The goal of the SBNMS MOC planning charrette was to further analyze and confirm the conceptual direction of the boathouse renovation, develop detailed space requirements, and vet any remaining concerns, issues, or ideas regarding the project. The best time to make changes to a project are before the design process begins, and the charrette gave the opportunity for continuing input regarding the progression of the project. ONMS is committed to making informed decisions regarding capital investments through detailed analysis.

Charrette Process

The planning charrette brought over 20 stakeholders together, including project engineers and architects, SBNMS staff, and ONMS headquarters staff, to further develop the vision and requirements for the project. During the charrette, SBNMS staff members were asked to focus on the long-term vision and mission of the sanctuary. Participants were asked to weigh in on their thoughts and concerns with the boathouse renovation. Discussion focused on the following big picture issues:

- Does this project complement the long-range vision for the campus?
- Are other partnering opportunities available? Current partnership opportunities include the proposed marine park, heritage trail, and the new Maritime Center.
- How long will this project satisfy the needs of the sanctuary?
- Is this how the sanctuary should be using this space?
- Are education and outreach needs properly addressed?
- What are the research and science needs to support the sanctuary mission?
- Have all of the requirements been addressed? Are there other needs?
- What is the impact of pier improvements, shoreline issues, and parking?
- What is the budget for the project?

The vision and requirements of this project were first developed in the sanctuary Draft Management Plan 2008 and the project continues to follow management plan objectives.

Project Scope and Summary

The MOC project will provide the following improvements to the existing facilities and infrastructure:

- **Boathouse Renovation:** The boathouse will be renovated to create the MOC and provide additional support space.

EXECUTIVE SUMMARY

Existing building systems and utilities will be upgraded as part of this project.

- **New Parking Lot:** The recently acquired adjacent property will be improved with pervious paving and associated landscape improvements to provide parking for a minimum of 23 vehicles.

Renovation Summary

The following spaces were reviewed during the planning charrette for their function and requirements:

- A **Large Multipurpose Room** will be the largest and most important space in the MOC. The space should be flexible to support a variety of functions, including seminars and education, boat repair, and science and research missions to support the sanctuary now and in the future.
- To support sanctuary enforcement and research operations, a **boat repair shop** is needed to maintain vessels with tools, benches, HAZMAT storage for chemicals, and general workspace.
- The **Dry Lab** will provide SBNMS staff the right kind of specialized space to work on Remotely Operated Vehicles (ROVs), videos, and manage live video feeds connected to the sanctuary.
- The versatile **Wet Lab** will provide flexible space for education, analysis, and sanctuary research through sea tables with both closed aquaria and a flow-through system.
- A **Dive locker** to support year-round NOAA dive operations in the sanctuary that will include gear storage and workspace. The dive locker will be designed to support a compressor and fill station in the future.
- **Bunking space** to support visiting scientists, interns, and university students. This provides the ability to complete long-term research projects, attracts students, and provides sleeping quarters in areas where hotels are cost prohibitive or unavailable.

The spaces in the MOC should be flexible and adapt to changing needs of SBNMS. The renovation should tie into the larger SBNMS campus and planning efforts for the neighborhood, which include a possible marine park and harbor walk from the town's new Maritime Center. Although the building is not listed on the historic register, the renovation will preserve and highlight the MOC as an iconic structure on Scituate Harbor.



An example of a touch tank at the Marine Science Institute at UCSB, which is used for the Oceans-to-Classrooms K-12 outreach and education program. (Source: MSI)

Charrette Analysis

3

The planning charrette discussion focused on big picture issues affecting the new MOC. Because all sanctuary buildings must fill many roles, it is important to consider how the MOC can tie in with all marine sanctuary missions. How the MOC supports both current mission and future strategy was the primary topic of discussion at the September 14, 2010 planning charrette. SBNMS staff was asked to weigh in on the factors that will make the project a success. The following topics were highlighted in this effort:

- Does this project complement the long-range vision for the SBNMS campus?
- What partnering opportunities exist through the MOC?
- How long will this project satisfy the needs of the site?
- Is this the most effective way for SBNMS to be using space?
- Are education and outreach opportunities accommodated?
- Are research and science opportunities accommodated?
- Have all the requirements been addressed?
- How do the pier improvements, shoreline issues, and new parking affect the design and function of the new MOC?

Facilities like the MOC serve as a connection to the surrounding community. The MOC should reflect SBNMS mission objectives and support a variety of functions.

Charrette Concepts

Partnering Opportunities

Partnerships have become critical to sanctuary mission objectives, allowing sites like SBNMS the ability to educate the public, gain exposure, and connect with communities. The sanctuary envisions that the MOC will help to develop research and science partnerships as well as outreach and education partnerships.



The new Maritime Center near the MOC will contain a 50-person classroom and display space, which could be a good partnering opportunity for SBNMS. (Source: Scituate Maritime Center)

Maritime Center and Marine Park

The sanctuary is currently working with several organizations that support the development of the adjacent lot that connects the boathouse to the city's new Maritime Center, a 1,200-square-foot building that will include a multifunction room, historical exhibits on the town's maritime history, public restrooms, and a 2,500-square-foot outdoor deck overlooking the inner harbor. Long-term planning for the area envisions a park and trail to connect the two properties, but the land is currently owned by a private trust. The town has pursued the goal of transforming the 3.2-acre parcel into the Scituate Marine Park, a multi-use site serving the local fishing industry, recreational boaters, and the general public. Currently the Scituate Waterways Commission, the Historic

CHARRETTE ANALYSIS

Preservation Commission, and the Conservation Commission are working on a proposal to set the land aside for use as green space. The Marine Park would be a community asset to expand the use of the waterfront and would likely attract visitors to the SBNMS campus. Because of the potential connection with the Marine Park, harbor trail, and Scituate Maritime Center, SBNMS' future development should be harmonious with nearby planning efforts. SBNMS also looks to partner with the Maritime Center facilities for educational programming and use of classroom facilities.

The design of the MOC should draw on the adjacency with the marine park and harbor trail by exploring the potential of the exterior and site design. NOAA and sanctuary messaging should be present outside the building (in a way that does not disturb neighboring residences). Several ideas were presented as ways to achieve this:

- Signs and interactive kiosks could potentially be placed along the harbor trail or along the parking lot and building approach.
- Landscaping features or artwork could be integrated into the surrounding site. The potential adjoining trails, parks, and shoreline can be considered in the campus design and interpretation.
- Unique architectural features such as a cupola, similar to those found at other sanctuary sites, could be worked into the design. A structural analysis must be conducted, and the roof trusses must be shown to be capable of handling the additional loading the cupola would bring. The look of the MOC, both at night and during the day, is an important consideration as the design progresses. Any exterior features or modifications will have to be carefully considered in partnership with the community and neighbors.
- Painting of the building's exterior can be an easy and inexpensive way to showcase the building and make it more visible to the public. Again, exterior modifications should be considered with the neighborhood landscape in mind.
- Graphics that can be applied directly to the building or onto removable screens.
- Creative lighting features or effects can give the building a nighttime presence.

These ideas could potentially draw interest to the MOC and NOAA endeavors through passive features that encourage people to learn more about the sanctuary.

Science and Research

Current science and research partners to the sanctuary are numerous. The site plans to use the MOC to attract even more

scientists, students, and researchers to the sanctuary for research. The addition of the wet and dry labs, dormitory space, and other visitor accommodations will contribute to the ability of SBNMS to further support science endeavors and will allow for expanded research capabilities at the sanctuary. The availability of these spaces will position the sanctuary for research grants and new research and university partners.



Taking advantage of a waterfront location can be a way to educate the public. (Source: ONMS)

Public Education – Formal and Informal

Educating the public about ocean conservation and the sanctuary system is intertwined in all sanctuary activities. The MOC will be designed with public education in mind and the various opportunities that it provides. Formal education is often accomplished through programming, but informal education is often more indirect. SBNMS staff were encouraged to “think outside the box” on innovative ways that the MOC can support public education. Ideas include:

- Community events or heritage days that could be held in the new parking lot or the MOC.
- The MOC could support volunteer programs that help spread the sanctuary message.
- Telepresence is the ability to connect people to the ocean and research missions through live video feeds and real-time technology. The new dry lab and multipurpose room will provide exciting new opportunities to develop telepresence at SBNMS.
- Local media often have an interest in research and what is going on at SBNMS and the new MOC can provide an exciting venue to present sanctuary happenings in real time.

SBNMS will continue to develop ideas and opportunities for the MOC as the project progresses.

Flexibility

Because the boathouse is uniquely situated on Scituate Harbor, it has the potential to become a more visible representation of SBNMS and the work that is done there. Creating flexible multi-functional spaces is critical to the success of the MOC. While many of the spaces in the building will have utilitarian functions, the site must develop ways to use each space to do more. Flexibility is an important concept in sanctuary spaces due mostly in part to changes that take place over time in technology advances, program requirements, and sanctuary maturity. Many concepts for flexibility were developed during the planning charrette to allow each space to function for everyday operations, but also serve secondary and even tertiary purposes, i.e. as a public education outlet for the sanctuary (public education does

CHARRETTE ANALYSIS

not have to involve a visitors center or museum). Simple measures can be taken at the MOC to allow the building to serve many functions, including:

- The multipurpose room design is key to the success of the MOC. The design of the space should allow for a variety of uses, including meetings, educational seminars, telepresence, media, and community events. This space has the unique opportunity for SBNMS to present “what we do” as it happens. The room should be designed with things like acoustics, lighting, and set design in mind.
 - The room will also be used in support of Acoustic Recording Unit (ARU) preparation prior to deployment. This exercise has been conducted every 90 days for about three years. This need is ongoing and planned for the future (although grant dependent).
- Messaging should be present outside the building’s walls. The MOC is part of the SBNMS campus and the renovation will aim to unify the campus, both internally and with the community.
- Provide infrastructure and cabling to support new and changing technologies, for both now and in the future.
 - Provide adequate electrical outlets and data ports throughout the building, along with wireless Internet (and the integration of wireless products as they are introduced).
 - Provide power supply systems that provide flexible service; reliable, clean power; and can adjust power delivery.
 - Provide wire management systems that enable quick and low-cost reconfiguration.
 - Distributed computing environments that have reliable cooling.
- The dive locker will be designed to accommodate a future filling station. The site’s dive program does not justify the inclusion now, but in three to five years the program dive operations may warrant the filling station.
- The first floor accessible accommodations could be used as an office or storage when not needed as a dormitory.
- The wet lab can serve both research objectives and provide a hands-on learning lab for local children. Double doors will be installed that will allow the wet lab to open to the large multipurpose room, thus making the lab larger and making it ideal for demonstrations.



ARU preparation takes place every three months and requires significant floor space. (Source: SBNMS)

Flexible spaces will be key to the success of the MOC and how the building functions to support the sanctuary mission. Building space should have the capability to support the current function, but the flexibility to be easily adapted to new functions as the

sanctuary grows and develops. Spaces will be designed that are easy to modify if the rooms function changes over time.

CHARRETTE ANALYSIS

Space and Adjacency Requirements

INTRODUCTION

This chapter outlines the space requirements and functional relationships of the program for the new MOC and describes the MOC project in physical terms.

The Space and Adjacency Requirements chapter will serve as a checklist for the architects as they design and lay out the interior portions of the project. This chapter includes the following sections:

- Symbols, Abbreviations, and Definitions
- Summary of the MOC and its affiliated spaces
- Detailed room-by-room requirements including diagrams and other specific attributes of the individual spaces.

This chapter contains room data sheets for each space identified to be included in the MOC. Each data sheet contains a test fit for the space, primary furniture and equipment to be accommodated in the space, technical requirements for the space including architectural, plumbing, and electrical requirements, and any additional information pertinent to the specific room or space. Test fits in this chapter were influenced by the recent feasibility study and are for illustration purposes only. They should not be considered a design directive and are a suggestion of the basic room layout and requirements; the final room layout and size will be adjusted to the building design and user preferences.

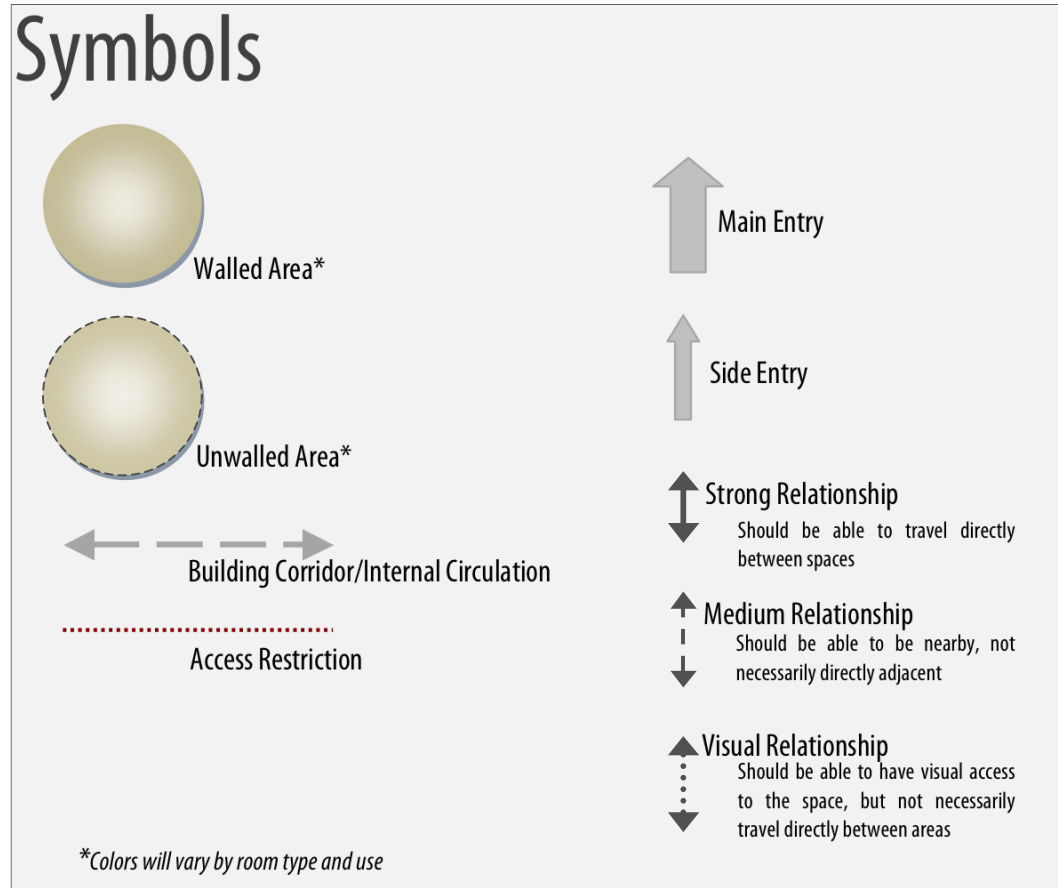
Some of the information in this chapter was taken from the *Feasibility Study for the Boathouse Renovation* report by Fraser and Fogle Architects.

Symbols, Abbreviations, and Definitions

This section identifies the symbols and abbreviations used in this chapter and it provides definitions of frequently used terms.

Symbols

The following symbols are used to illustrate key concepts in this chapter:



SPACE AND ADJACENCY REQUIREMENTS

Abbreviations

Many Terms used in this chapter have been abbreviated:

ABA	Architectural Barriers Act
ADA	Americans with Disabilities Act
AFCI	Arc Fault Circuit Interrupter
AFF	Above Finished Floor
ASF	Assignable Square Feet
AV	Audio Visual
FFE	Furniture, Fixtures, and Equipment
GFCI	Ground Fault Circuit Interrupter
GSF	Gross Square Feet
GWB	Gypsum Wall Board
HVAC	Heating, Ventilation and Air Conditioning
IT	Information Technology
LF	Linear Feet
MEP	Mechanical, Electrical, and Plumbing
MOC	Marine Operations Center
NMSS	National Marine Sanctuary System
NOS	National Ocean Service
RR	Restroom
SBNMS	Stellwagen Bank National Marine Sanctuary
SF	Square Feet
VCT	Vinyl Composition Tile

Definitions

Listed below are definitions of the frequently used terms in this chapter.

- **Assignable Square Feet (ASF)** – The usable area or area within the inside face of the interior walls of each space
- **Gross Square Feet (GSF)** – The area within the outside face of the exterior walls of the building which includes assignable square feet, non-assignable square feet, building service area, circulation area, mechanical area, and structural area
- **Non-Assignable Square Feet (NSF)** – Areas such as mechanical space, telecommunication closets, janitor closets, etc., which are an inherent part of the building, but are not usable space for the owner's program activities (includes building service, circulation, and mechanical areas)
- **Technical Requirements** – Mechanical, electrical, and plumbing (MEP) and other physical, technical, or building construction requirements.

SPACE AND ADJACENCY REQUIREMENTS

Project Description and Scope

The boathouse building is currently used for storage and boat repairs. The proposed project will renovate existing spaces to create a marine operations center and includes several new spaces that will support sanctuary missions. The new spaces will support sanctuary operations such as science and research, vessel operations, as well as outreach if needed.

The project also includes structural repairs to the pier, extending utilities to the boathouse and pier, and a new parking lot adjacent to the boathouse.

More specific information regarding the general building design can be found in Chapter Five.

New Space Summary

SBNMS Boathouse Renovation

Marine Operations Center

Name / Type of Space	Capacity	No. and Size of Space	Total Area (ASF)
Boat Shop		1 @ 400sf	400
Multipurpose Room		1 @ 1,000sf	1,000
Dive Locker		1 @ 250sf	250
Accessible Restroom		1 @ 45sf	45
Dry Lab		1 @ 300sf	300
Wet Lab		1 @ 230sf	230
Accessible Dorm Room/Office		1 @ 100sf	100
Men's Bunk	8	1 @ 175sf	175
Women's Bunk	6-8	1 @ 125sf	125
Restroom		1 @ 45sf	45
Shower		1 @ 25sf	25
Lounge/Conference Room	12	1 @ 225sf	225
Subtotal			2,920
<i>Net to Gross (80%)</i>			<i>730</i>
Building TOTAL			3,650

Overall Building Relationship / Adjacency Diagrams

The MOC will be designed as a two-story building. Most of the activities will be located on the first floor, with bunking and lounge spaces located on the second floor. The first floor will be a more public building zone, while the second floor is private for visitors and their belongings. Possible adjacency diagrams for the proposed design are shown on the following page. The building will have multiple entrance/egress points taking full advantage of the site. Many additional layouts are possible. It is important to note that the final design will be determined by SBNMS staff preferences, site constraints, programmatic needs, and cost considerations.

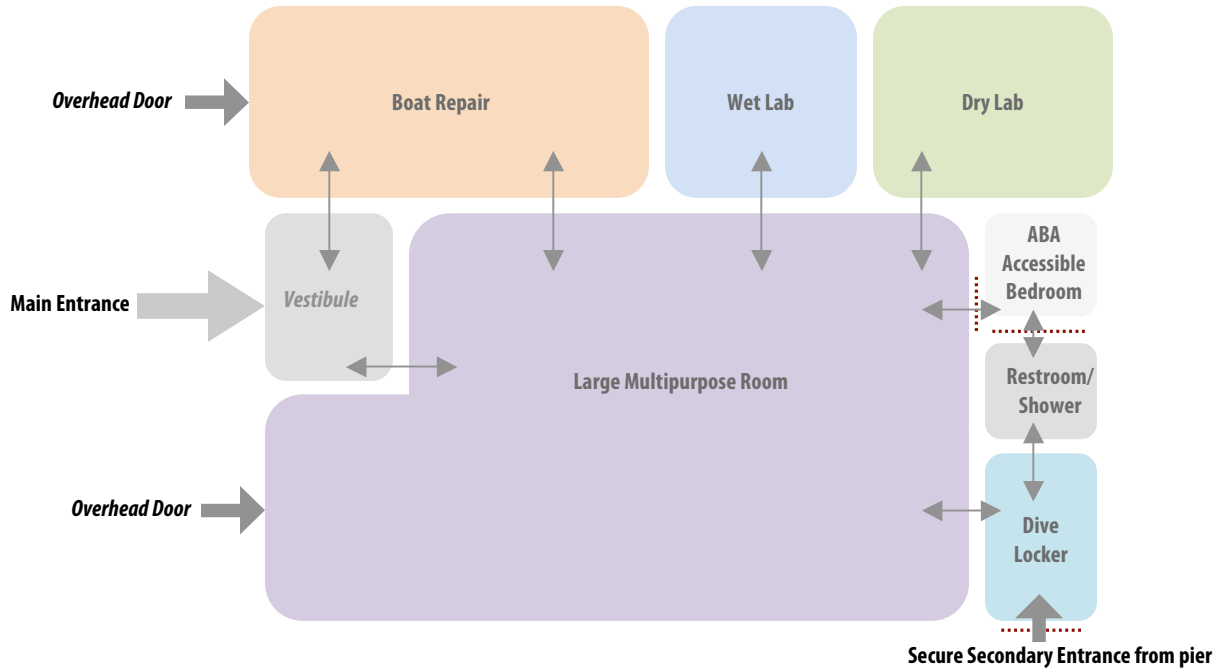
Overall Adjacencies

The following list describes a few of the key adjacencies that are required in the design of MOC:

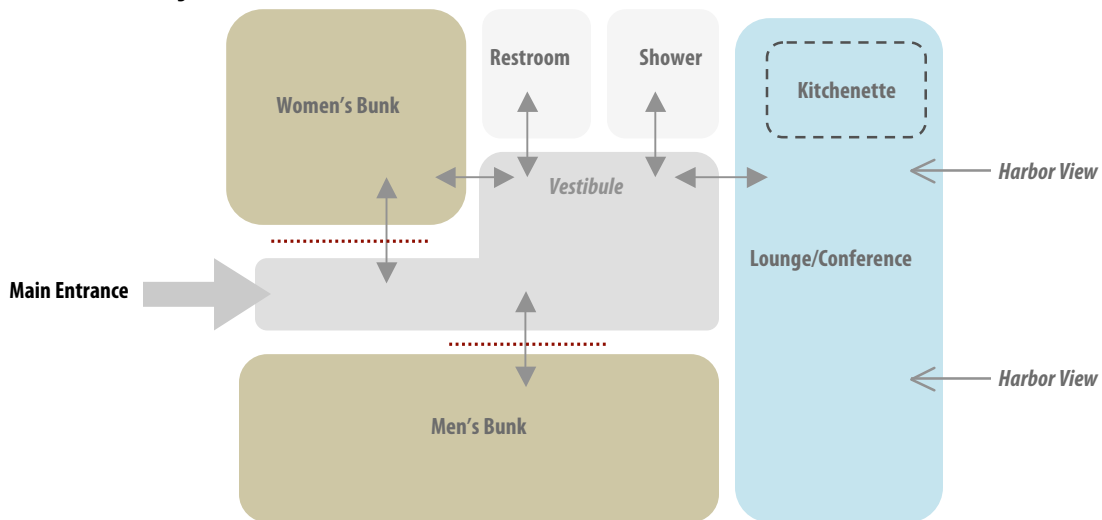
- The large multipurpose room will be the largest building space and provide circulation to other building spaces.
- There should be a vestibule at the main entry that controls access to other building areas.
- The boat repair shop and large multipurpose room require exterior access via the two existing rolling doors to allow trucks and/or boats to back into the space for loading/unloading.
- The multipurpose room should connect to the wet lab with double doors that allows the wet lab to open up to the multipurpose room to create a larger space.
- The dive locker should be on the first floor and accessible from the pier through an exterior door. The dive locker should have direct access to the first floor restroom and shower.
- The first floor restroom should be accessible from both the large multipurpose room and the dive locker.
- The second floor will accommodate visitor accommodations. Both the men and women's bunkroom should have access to the shower and restroom as well as the shared lounge. A separate shower and restroom space is preferred to allow for multiple users.
- Control access to the second floor spaces for visitor security.

Building Adjacency Diagrams

First Floor Adjacencies



Second Floor Adjacencies



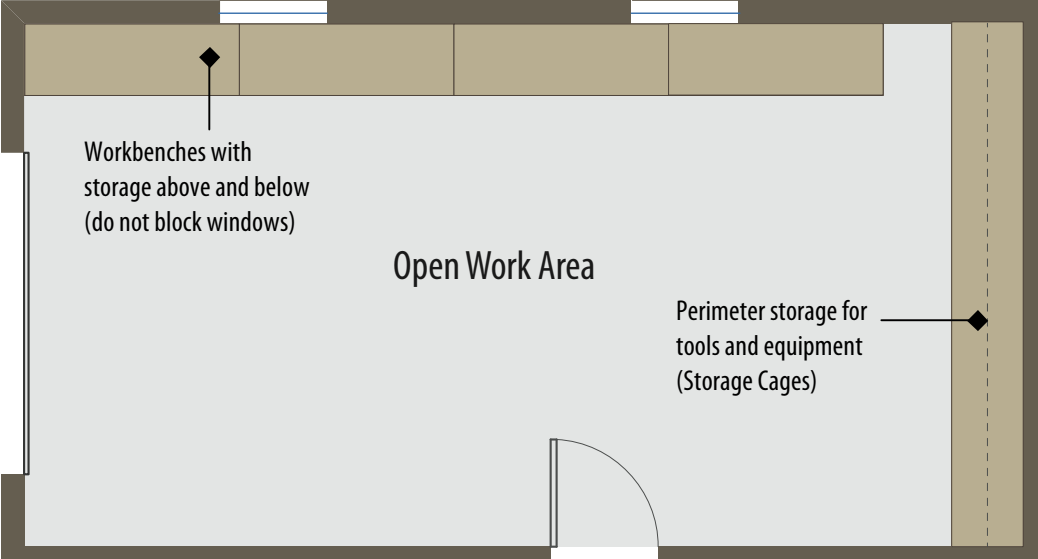
Note: Dormitory accommodations—including shared kitchen and restroom spaces must be handicapped accessible. Options for consideration include relocation of these spaces to the main floor or providing equivalent facilitation at the adjacent administration building.

Marine Operations Center Overview

The rest of this chapter will be devoted to describing the critical components of each room contained within the MOC Spaces. A data sheet describing the technical requirements of each room along with test fits, where helpful, are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layouts during the design process and the room configuration will be adjusted to the building architecture and user preferences. FFE lists are also included in this chapter; although FFE is not part of this design contract it is included for ONMS planning purposes only.

Boat Repair Shop and Storage

The boat shop will be used for minor vessel repairs and storage of tools and chemicals associated with boat repair. The boat shop should be located on the first floor with access to a large rolling door.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Boat Repair Shop

Room Data

Number of Rooms	1
Capacity	-

Architectural

Wall Finish	Painted GWB
Floor Finish	Wood
Base	N/A
Ceiling Finish	Open
Min. Ceiling Height	15'-0"
Minimum Door Width	4'-0"; See Note 5
Exterior Access (at room)	Yes-Existing Rolling Door
Windows / Natural Light	Yes; See Note 4
Acoustical Privacy	Yes, Add Sound Batts
Other	N/A
Security	Lock and Key

Electrical

Power	120V / See Note 6
Emergency Power	No
Voice	Yes; See Note 2
Data	N/A
Audio / Visual	N/A
Special Wiring	Yes; See Note 1
Lighting	Fluorescent

Environmental

Special Venting / Filtration	Yes; See Note 8
Other	N/A

Plumbing

Hot / Cold Water	No
Floor Drain	No
Other	N/A

Notes

1. Convenience outlets should be placed at regular intervals on perimeter walls in compliance with all codes. New GFCI/AFCI receptacles to be installed in compliance with codes. Coordinate with user for information concerning the need for additional outlets for charging and/ or storing tools.
2. Room shall have a minimum of (1) telephone port.
3. All finishes shall allow for easy cleaning and durability.
4. Provide ability to control natural light.
5. Provide a 4' door to the adjacent Multipurpose Room.
6. Minimize sound transmissions into and out of room.
7. Room shall have a grounded workbench.
8. Room shall have an exhaust canopy or an exhaust system to extract chemical, paint or welding fumes.
9. Walls shall have protective bumpers.
10. Verify specific tools with users; some tools will require dedicated floor space.

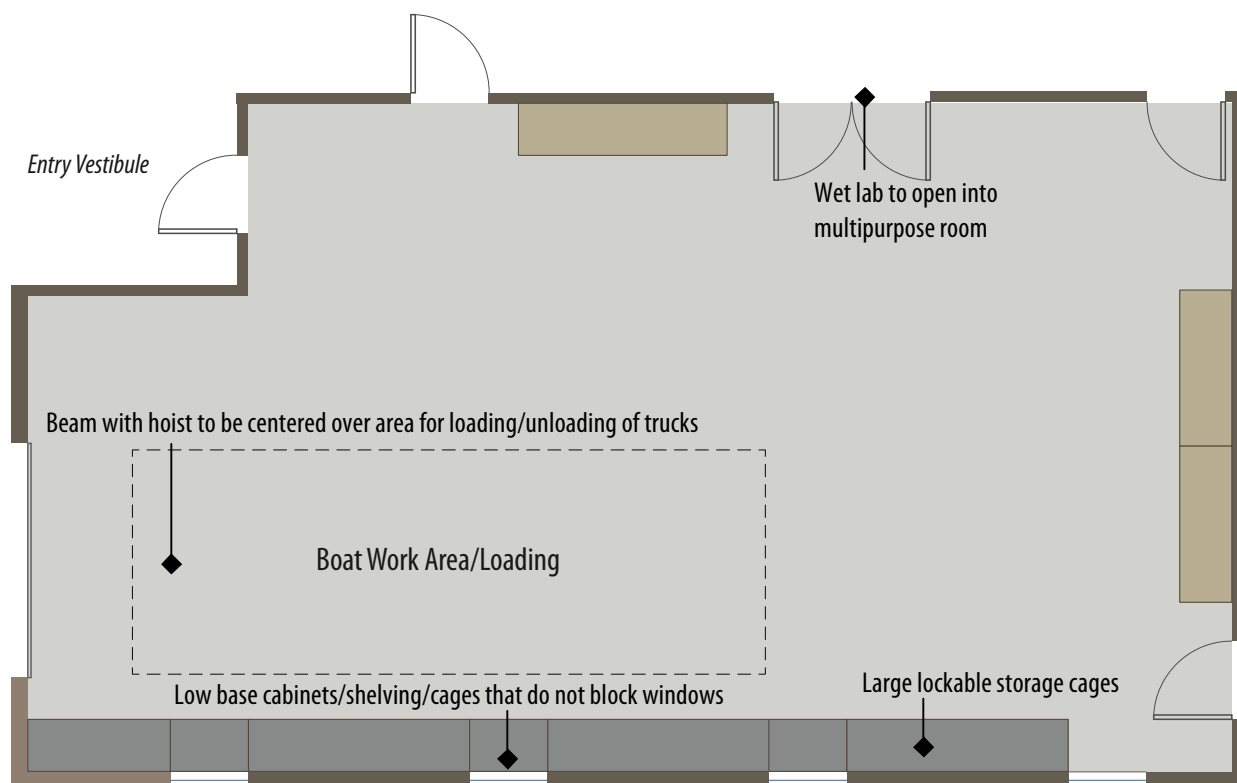
Furnishings, Fixtures and Equipment

Furnishings, Fixtures and Equipment	No.
Tool Storage Cabinet	1
Drill Press	1
Table Saw	1
Portable Compressor	1
Window shades - as required	
Welders (specific type to be verified with users)	1
Work Bench	1
Chemical Storage Cabinet	1
Adjustable Shelving System	1
Refinishing/ Detailing Tools	As Needed
Compressed Air Tools	As Needed
Fire Extinguisher	1
Lockable Storage Cages	3

SPACE AND ADJACENCY REQUIREMENTS

Multipurpose/Work Room

The multipurpose room should be flexible for a variety of uses. Storage should be provided at the perimeter along with adequate space for boat repairs and a loading/unloading area. The room should also have the ability to support media and AV equipment for education, telepresence, and events (e.g. lighting and a green screen set). A beam should be centered above this area to support an equipment hoist. Provide direct adjacency with the wet lab and the ability to open up the space to create a larger space for group learning.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Large Multipurpose Room

Room Data

Number of Rooms	1
Capacity	50

Architectural

Wall Finish	Painted GWB
Floor Finish	Wood
Base	N/A
Ceiling Finish	Open
Min. Ceiling Height	15'-0"
Minimum Door Width	See Note 3
Exterior Access (at room)	N/A
Windows / Natural Light	Preferred, See Note 10
Acoustical Privacy	N/A
Other	See Note 4
Security	N/A

Electrical

Power	120V / See Note 3
Emergency Power	No
Voice	Yes
Data	See Note 4
Audio / Visual	See Note 7
Special Wiring	N/A
Lighting	See Note 2

Environmental

Special Venting / Filtration	No
Other	N/A

Plumbing

Hot / Cold Water	No
Floor Drain	No
Other	See Note 9

Note: Verify shelving needs with users. Shelving/storage cages may not be required on all perimeter walls of space. Large pieces of equipment will require floor space.

Notes

1. All finishes shall allow for a multitude of uses for the space. Area should be flex space for seminars, exhibition staging, storage, ROV and work/repair areas.
2. Provide variable overhead fluorescent lighting.
3. Convenience outlets should be placed at regular intervals on perimeter walls in compliance with all codes. New GFCI/AFCI receptacles to be installed in compliance with codes. A receptacle shall be placed within one (1) feet of all data ports. Place a minimum of (2) ceiling outlets for flexibility.
4. Data outlets should be placed at regular intervals on perimeter walls to accommodate all A/V and IT equipment as required. Minimum of two data ports required.
5. Minimize sound transmissions into and out of room.
6. Provide ability to control natural light.
7. Provide wiring to support a built-in sound system, ceiling mounted projector, and motorized projection screen.
8. Ground level storage should be provided with cages having individual doors and palletized overhead storage capacity. Take care not to block windows with storage units.
9. Provide plumbing to support a wall mounted ADA water fountain.
10. Accommodate hoist system (2,000 lbs) centered above main floor area with structural beam (centered above bay) to allow for truck loading.
11. Consider an area for a green screen to be hung for broadcasting.

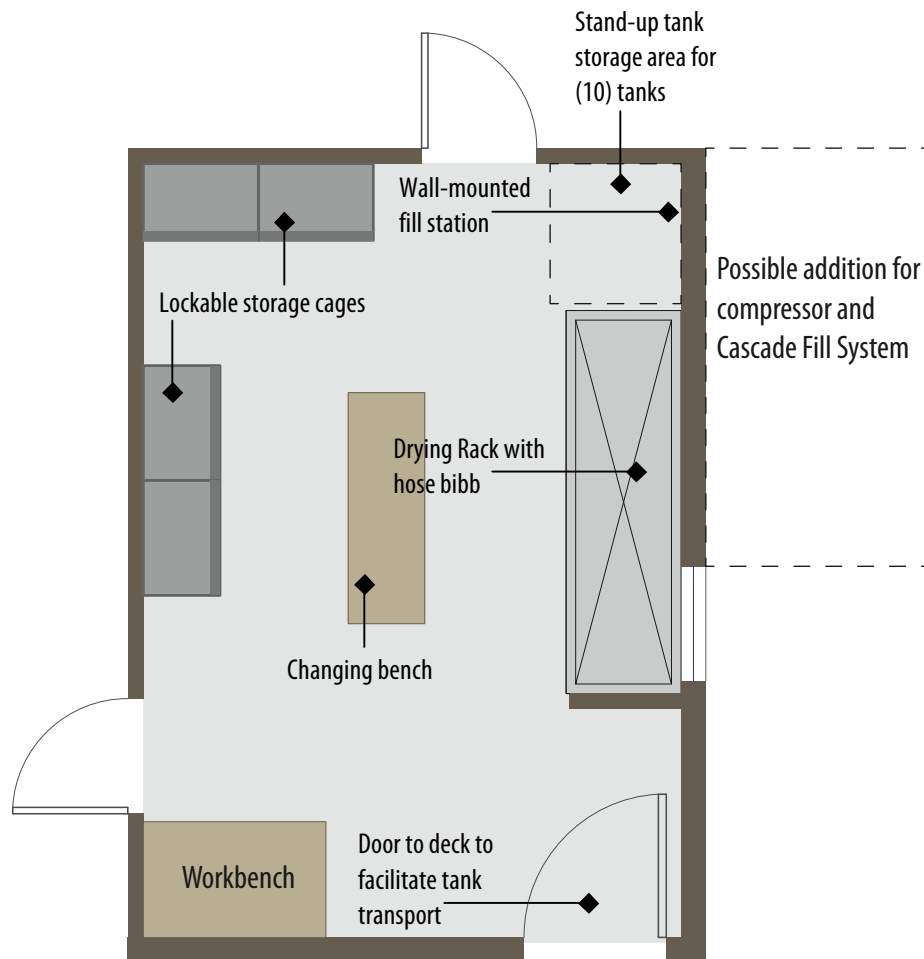
Furnishings, Fixtures and Equipment

	No.
Ceiling mounted data projector	1
Sound System	1
Integrated Audio Amplifier	1
Projection Screen (large)	1
Telephone	1
Window shades - as required	
Wireless Microphone	1
Wall Mounted Water Fountain	1
Wall Mounted Clock	1
Chain Link Steel Storage Cages	6

SPACE AND ADJACENCY REQUIREMENTS

Dive Locker

The dive locker will be used for year round dive operations and gear storage. The room should be directly adjacent to the first floor restroom and have exterior access from the pier. Provide a seating bench for changing, a drying rack for dry suits, and lockable storage cages. The room should be designed to accommodate a scuba cylinder fill system to eventually be located in an outside shed with a fill connection coming into the MOC. SBNMS does not dive enough to merit a fill system now, but the need for a fill system should be considered for the future. Dive locker best practices can be found in Chapter Five of this document.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Dive Locker

Room Data

Number of Rooms	1
Capacity	5

Architectural

Wall Finish	Painted GWB (Green Rock)
Floor Finish	Wood
Base	N/A
Ceiling Finish	Open
Min. Ceiling Height	9'-0"
Minimum Door Width	4'-0"; See Note 3
Exterior Access (at room)	Yes
Windows / Natural Light	Yes
Acoustical Privacy	N/A
Other	See Note 5
Security	Lock and Key

Electrical

Power	120V / See Note 1
Emergency Power	No
Voice	Yes
Data	Yes
Audio / Visual	N/A
Special Wiring	N/A
Lighting	Fluorescent Lighting

Environmental

Special Venting / Filtration	Yes
Other	N/A

Plumbing

Hot / Cold Water	Yes
Floor Drain	Yes-at drying rack
Other	Hose bibb at drying rack

Notes

1. Convenience outlets should be placed at regular intervals on perimeter walls in compliance with all codes. New GFCI receptacles to be installed in compliance with applicable codes. A receptacle shall be placed within one (1) feet of all data ports.
2. Provide hose bibb at drying rack for rinsing gear. Provide floor drain at drying rack with sloped water resistant flooring.
3. Dive locker must have 4' exterior door with access from pier.
4. Provide adjacent restroom with ADA shower, lavatory, and toilet. Restroom should also be accessible from large multipurpose room.
5. All finishes shall allow for easy cleaning and durability. Finishes shall be corrosion-resistant.
6. Provide seating bench for changing area.
7. Consider vestibule from adjacent multipurpose room for security.
8. Provide key pad entry from exterior.
9. Room design to be approved by NOAA dive program.
10. Room to be accessible from vestibule for increased security.
11. Provide increased ventilation and humidity control to prevent mold.
12. The room should be designed to accommodate a fill system in the future.

Furnishings, Fixtures and Equipment

No.

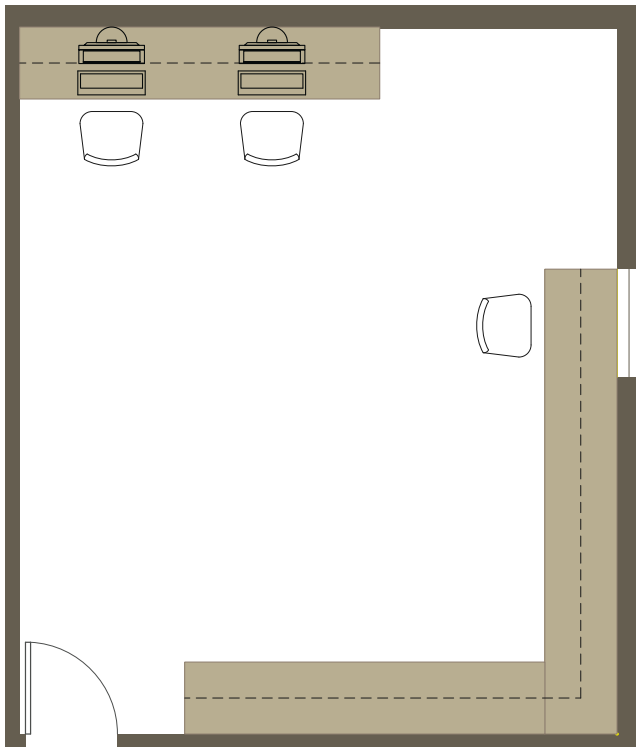
Stainless Steel Mesh Lockers (36"x24"x24")	8
Changing Bench	As Needed
Drying Rack	As Needed
Tank Rack	As Needed
Telephone	1
Cylinder Storage for (10) tanks	

Note: ASF of dive locker could be reduced to accommodate downstairs accessible accommodation.

SPACE AND ADJACENCY REQUIREMENTS

Dry Lab

The Dry Lab is specific to work with dry stored materials, electronics, and/or large instruments. The dry lab should support a variety of functions including ROV and AOV support, video editing, live video feeds, and computer/IT support. The room could also provide potential space for accessible sleeping accommodations. The room should be climate and humidity controlled with dust control. Provide space for the building IT data racks within the lab.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Dry Lab

Room Data

Number of Rooms	1
Capacity	4

Architectural

Wall Finish	Painted GWB w/ vapor barrier
Floor Finish	Anti-static plastic laminate panel
Base	Rubber
Ceiling Finish	Acoustical Tile System
Min. Ceiling Height	9'-0"
Minimum Door Width	48"
Exterior Access (at room)	No
Windows / Natural Light	Yes; See Note 6
Acoustical Privacy	N/A
Other	N/A
Security	Lock and Key

Electrical

Power	120/240V; See Note 1
Emergency Power	Yes
Voice	Yes
Data	Yes; See Note 7
Audio / Visual	No
Special Wiring	Yes; See Note 1
Lighting	Non-Glare Fluorescent

Environmental

Special Venting / Filtration	Yes; See Notes 3 & 4
Other	Positive relative pressurization

Plumbing

Hot / Cold Water	N/A
Floor Drain	No
Other	N/A

Notes

- Convenience outlets should be placed at regular intervals above work benches on perimeter walls in compliance with all codes. GFCI outlets shall be utilized at countertop locations. Provide power strip (120/220V) at perimeter counter space. A receptacle shall be placed within one (1) feet of all data ports.
- Lab to have positive pressure relative to other spaces; no return air from lab to other spaces.
- Provide constant temperature and humidity. Ambient temperature of 72°F ± 2°F.
- Room should be dust controlled with no separate exhausting. Minimum air exchange rate of 8 air changes/hour.
- Provide ability to control natural light.
- Computer/Network server and related equipment to be located in dry lab.
- Data outlets should be placed at regular intervals above benches on perimeter walls to accommodate all A/V and IT equipment as required. A minimum of (3) data ports should be provided.

Furnishings, Fixtures and Equipment

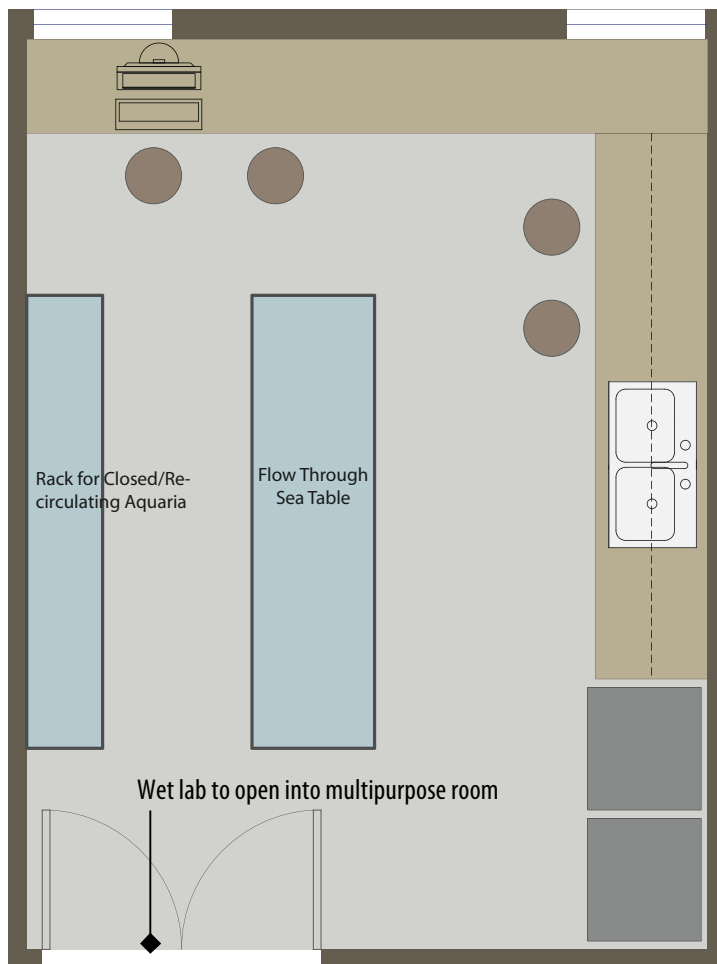
	No.
Stool	2
Computer	2
Lab Bench	TBD
Solvent Storage Cabinet	1
Telecommunications equipment	As Required
Cable terminations	As Required
Cable interconnection apparatus	As Required
Standard EIA 19-inch open frame equipment racks	As Required

Note: Verify chemical/solvent storage requirements with user

SPACE AND ADJACENCY REQUIREMENTS

Wet Lab

The wet lab will be used for research and science as well as education. The space should be directly adjacent to the large multipurpose room with double doors allowing the wet lab to open up to the multipurpose room. The wet lab should be piped with flow-through seawater from the adjacent harbor. The sanctuary will use both a flow through seawater table and a closed seawater table (to accommodate handling of bio-invasive that cannot be released back into the environment).



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Wet Lab

Room Data

Number of Rooms	1
Capacity	12

Architectural

Wall Finish	Epoxy Painted GWB/Green Rock
Floor Finish	Welded Seam Sheet Linoleum (turned up at wall) or Clay Tile
Base	N/A
Ceiling Finish	Water Resistant Acoustic Tile
Min. Ceiling Height	9'-0"
Minimum Door Width	6'-0" with no center astragal
Exterior Access (at room)	No
Windows / Natural Light	Preferred; See Note 7
Acoustical Privacy	N/A
Other	N/A
Security	Lock and Key

Electrical

Power	120/240V; See Note 1
Emergency Power	No
Voice	See Note 3
Data	See Note 2
Audio / Visual	N/A
Special Wiring	N/A
Lighting	Fluorescent; See Note 6

Environmental

Special Venting / Filtration	Yes; See Note 12
Other	N/A

Plumbing

Hot / Cold Water	Yes, See Note 4
Floor Drain	Yes
Other	Combo Eyewash/SS See Note 11

Furnishings, Fixtures and Equipment

Paper Towel Dispenser + Mounting	2
Glove Box Dispenser + Mounting	1
Adjustable Shelving	TBD
Large Stainless Steel Utility / Trough Sink	1
Wall Mounted Soap Dispenser	2
Hand Sanitizer Dispenser + Mounting	2
Small Aquarium	1
Salt Water Closed/Re-circulating Aquarium + Rack	1

Notes

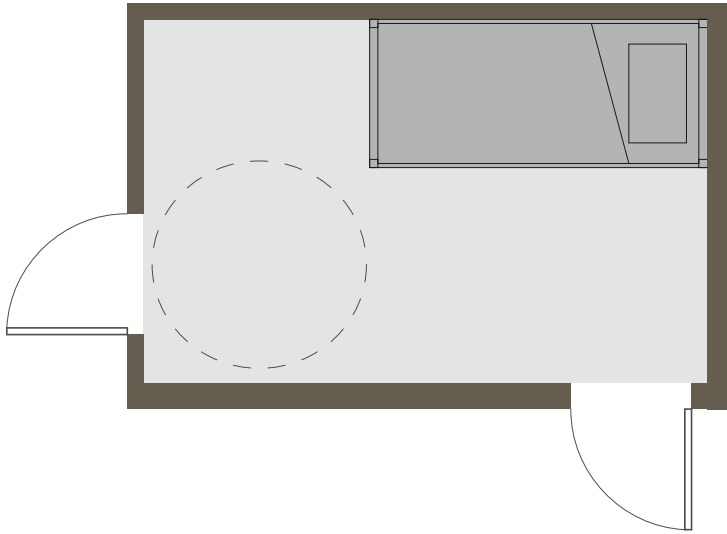
1. Convenience outlets should be placed at regular intervals on perimeter walls in compliance with all codes. GFCI outlets shall be utilized at countertop locations. A receptacle shall be placed within one (1) feet of all data ports.
2. Data outlets should be placed at regular intervals on perimeter walls; coordinate location of computer stations. Provide a minimum of (3) data ports.
3. Provide telephone near door.
4. Provide hot and cold water services for sink. Also provide necessary plumbing for a refrigerator / freezer units.
5. All finishes shall allow for easy cleaning and durability. Finishes and sealants should be corrosion-resistant. Stainless Steel pipe hangers and anchors should be provided. Wet wall shall have ceramic tile wainscot.
6. Provide overhead corrosion-resistant lighting fixtures
7. Provide ability to control natural light.
8. Provide a 6' door with no center astragal to the adjacent great room.
9. Provide hose bibb at wet wall to wash down tanks and spills.
10. Wall and base cabinets are wood with pressure-treated, water-resistant wood used at 6" high floor bases. Special attention should be given to the design of seams to assure that no moisture penetrates to the substrate materials. Tops should be epoxy resin or other corrosion resistant surface. Provide both sitting and standing height work surface.
11. Provide re-circulated seawater to sea table that drains to a central runoff drain. Plastic pumps, valves, filters, and piping shall be provided. All equipment should be located in secure area. Redundant supply line shall be provided. Protect exterior plumbing from freezing.
12. Provide heating and ventilation/exhaust for this space.

No.	Furnishings, Fixtures and Equipment	No.
2	Refrigerator	1
1	Freezer	1
TBD	Lab Bench with upper and lower cabinets	TBD
1	Window shades - as required	
2	Computer	1
2	Stool	4
1	Salt Water Flow-Thru Tank (4" Deep) w/ epoxy coated	
1	pressure treated lumber base (Stainless steel fasteners)	3

SPACE AND ADJACENCY REQUIREMENTS

Accessible Dorm Room (office, Storage)

Space has been allotted to include a handicapped accessible dormitory room on the building's first floor. This space should be flexible to be functional as a bedroom when needed, but when not in use could be used as an office or storage.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Accessible Dorm Room

Room Data

Number of Rooms	1
Capacity	1

Architectural

Wall Finish	Painted GWB
Floor Finish	Existing
Base	N/A
Ceiling Finish	Exposed roof joist and/or painted GWB
Min. Ceiling Height	7'-0"
Minimum Door Width	3'-0"
Exterior Access (at room)	No
Windows / Natural Light	Yes; See Note 2
Acoustical Privacy	Yes; See Note 3
Other	N/A
Security	Lock and Key

Electrical

Power	See Note 1
Emergency Power	No
Voice	No
Data	Yes; See Note 1
Audio / Visual	No
Special Wiring	N/A
Lighting	Non-Glare Fluorescent

Environmental

Special Venting / Filtration	N/A
Other	N/A

Plumbing

Hot / Cold Water	No
Floor Drain	No
Other	N/A

Notes

1. Provide GFCI/AFCI duplex receptacles in compliance with all applicable codes. Provide a receptacle within one (1) feet of data port. A minimum of two (2) data ports shall be provided and shall be located on wall opposite entry point.
2. Provide ability to control natural light.
3. Minimize sound transmissions into and out of room.

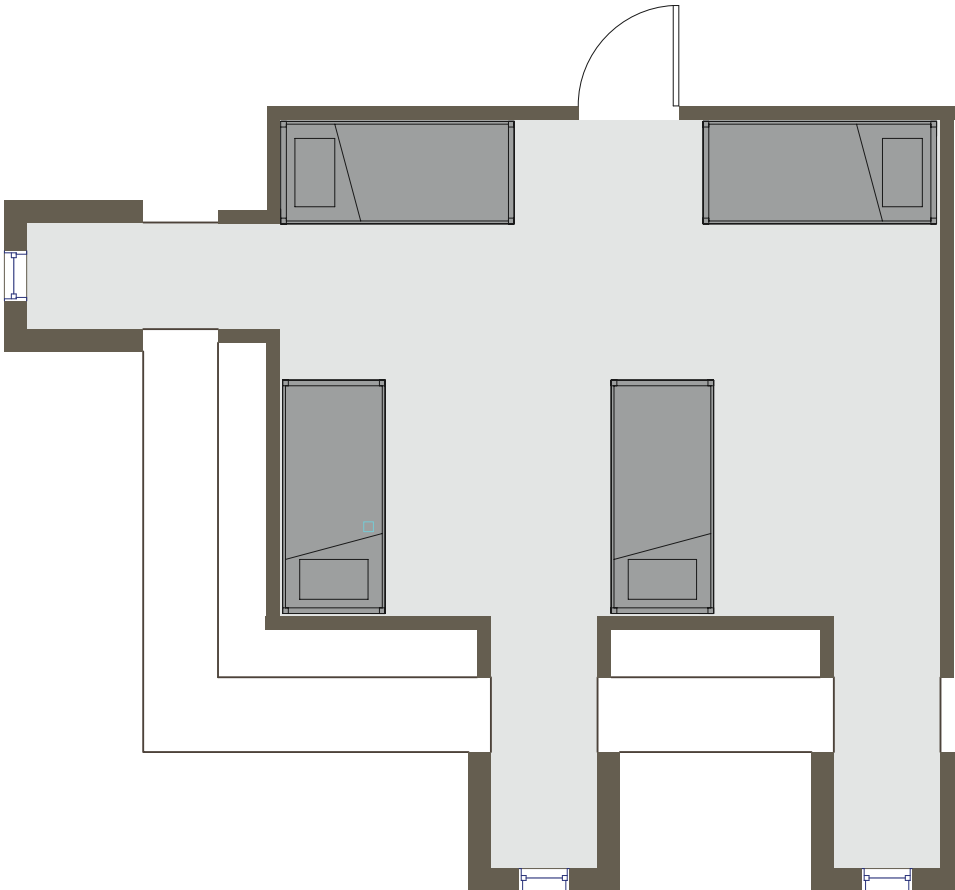
Furnishings, Fixtures and Equipment

	No.
Single Bed (can be wall-mounted folding bed)	1
Lockers	1

SPACE AND ADJACENCY REQUIREMENTS

Men's Bunk

The men's bunk will provide sleeping quarters for eight men in bunk beds. The space is proposed to be on the building's east-facing side. Windows will be replaced to increase views around the building.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Men's Bunk

Room Data

Number of Rooms	1
Capacity	8

Architectural

Wall Finish	Painted GWB
Floor Finish	Carpet
Base	Rubber
Ceiling Finish	Exposed roof joist and/or painted GWB
Min. Ceiling Height	7'-0"
Minimum Door Width	3'-0"
Exterior Access (at room)	No
Windows / Natural Light	Yes; See Note 2
Acoustical Privacy	Yes; See Note 3
Other	N/A
Security	Lock and Key

Electrical

Power	See Note 1
Emergency Power	No
Voice	No
Data	Yes; See Note 1
Audio / Visual	No
Special Wiring	N/A
Lighting	Non-Glare Fluorescent

Environmental

Special Venting / Filtration	N/A
Other	N/A

Plumbing

Hot / Cold Water	No
Floor Drain	No
Other	N/A

Notes

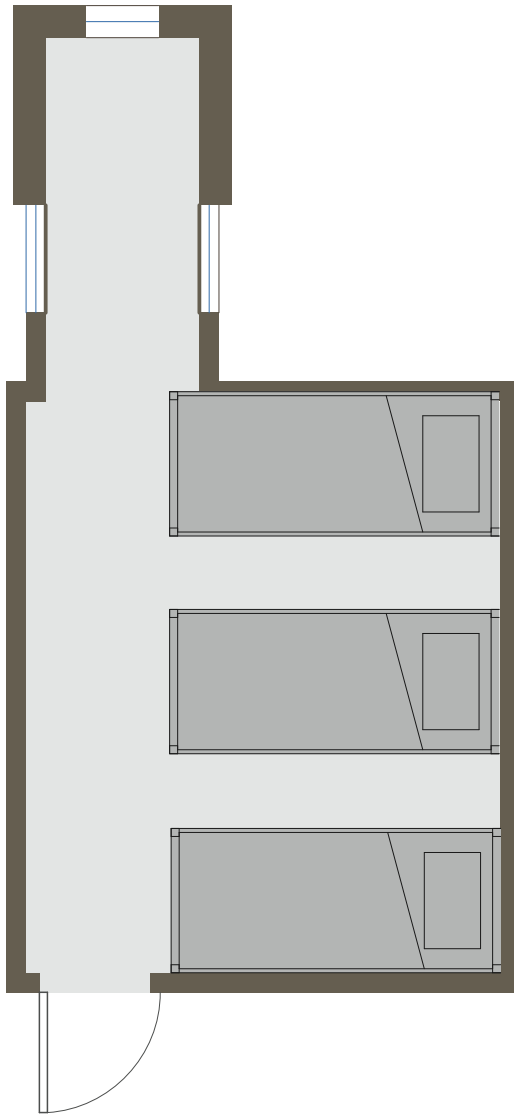
1. Provide GFCI/AFCI duplex receptacles in compliance with all applicable codes. Provide a receptacle within one (1) feet of data port. A minimum of two (2) data ports shall be provided and shall be located on wall opposite entry point.
2. Provide ability to control natural light.
3. Minimize sound transmissions into and out of room.
4. ADA quarters should be provided as required by code.
5. Provide four lockable storage lockers to store visitor belongings.
6. Avoid blocking dormers if possible.

Furnishings, Fixtures and Equipment

	No.
Bunk bed (Single)	4
Lockers	8

Women's Bunk

The women's bunk will provide sleeping quarters for six to eight women in bunk beds. The space is proposed to be on the buildings west-facing side. Windows will be replaced to increase views around the building.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale.

SPACE AND ADJACENCY REQUIREMENTS

Women's Bunk

Room Data

Number of Rooms	1
Capacity	4

Architectural

Wall Finish	Painted GWB
Floor Finish	Carpet
Base	Rubber
Ceiling Finish	Exposed roof joist and/or painted GWB
Min. Ceiling Height	7'-0"
Minimum Door Width	3'-0"
Exterior Access (at room)	No
Windows / Natural Light	Yes; See Note 2
Acoustical Privacy	Yes; See Note 3
Other	N/A
Security	Lock and Key

Electrical

Power	See Note 1
Emergency Power	No
Voice	No
Data	Yes; See Note 1
Audio / Visual	No
Special Wiring	N/A
Lighting	Non-Glare Fluorescent

Environmental

Special Venting / Filtration	N/A
Other	N/A

Plumbing

Hot / Cold Water	No
Floor Drain	No
Other	N/A

Notes

1. Provide GFCI/AFCI duplex receptacles in compliance with all applicable codes. Provide a receptacle within one (1) feet of data port. A minimum of one (1) data port shall be provided and shall be located on wall opposite entry point.
2. Provide ability to control natural light.
3. Minimize sound transmissions into and out of room.
4. ADA quarters should be provided as required by code.
5. Provide four lockable storage lockers to store visitor belongings.
6. Avoid blocking dormers if possible.

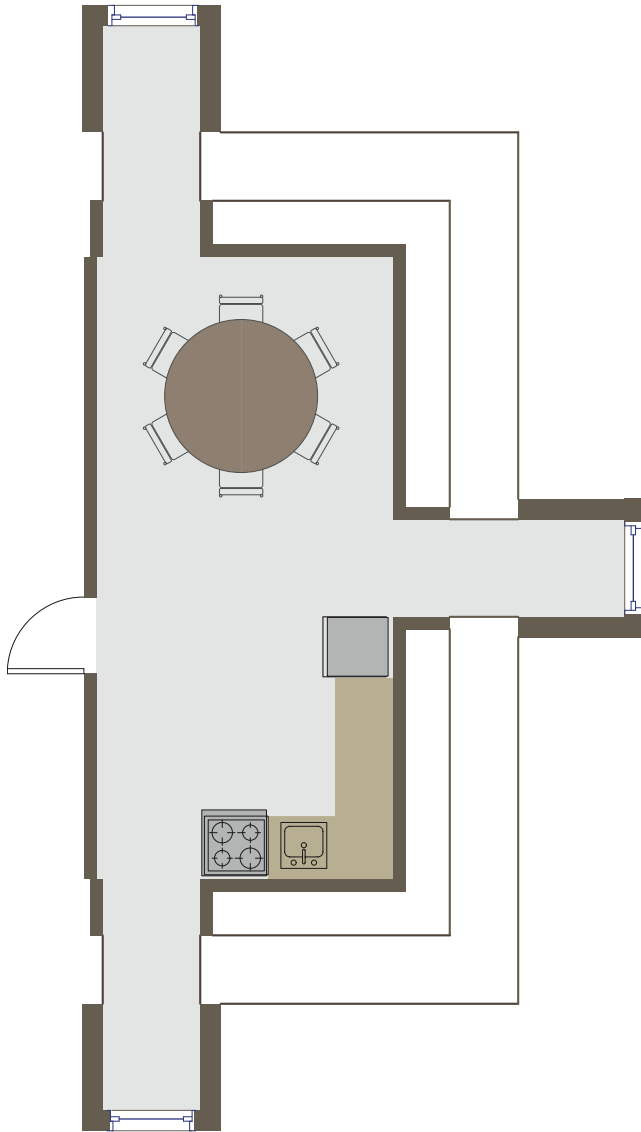
Furnishings, Fixtures and Equipment

No.

Bunk bed (Single)	3-4
Lockers	6-8

Lounge/Conference Room

The lounge and conference room area will be a multipurpose space primarily for use by visitors staying at the MOC. A small kitchenette area will be provided within this space. The lounge should provide a good view of the Scituate Harbor on the building's north-facing side.



Note: Test fits are provided as a means to judge the appropriateness of size against basic room requirements. The designer will determine the final room layout during the design process and the room will be adjusted to the building design and user preferences. Drawing is not to scale. Space for FFE is planned, but actual equipment purchase is not part of this project.

SPACE AND ADJACENCY REQUIREMENTS

Lounge/Conference Room

Room Data

Number of Rooms	1
Capacity	12

Architectural

Wall Finish	Painted GWB
Floor Finish	Carpet / VCT
Base	Rubber
Ceiling Finish	Exposed roof joist and/or painted GWB
Min. Ceiling Height	7'-0"
Minimum Door Width	36"
Exterior Access (at room)	N/A
Windows / Natural Light	Preferred, See Note 5
Acoustical Privacy	Normal
Other	N/A
Security	Lock and Key

Electrical

Power	See Notes 1 & 4
Emergency Power	No
Voice	See Note 2
Data	See Note 3
Audio / Visual	No
Special Wiring	No
Lighting	Non-Glare Fluorescent

Environmental

Special Venting / Filtration	See Note 8
Other	N/A

Plumbing

Hot / Cold Water	Yes; See Note 7
Floor Drain	No
Other	N/A

Notes

1. Provide a minimum of four (4) GFCI/AFCI duplex receptacles in compliance with all applicable codes. Provide a receptacle within one (1) feet of data ports.
2. Provide one (1) telephone port.
3. A minimum of four (4) data ports shall be provided; one on each perimeter wall.
4. Provide additional power connections for an electric range/oven, dishwasher, refrigerator, and other appliances on the kitchenette wall.
5. Provide ability to control natural light.
6. Minimize sound transmissions into and out of room.
7. Provide hot and cold water services for a kitchenette / sink. Also provide necessary plumbing for a refrigerator / freezer unit with water services in the door and a dishwasher. Coordinate location of pipes with room configuration and layout.
8. Electric range and oven will require venting to code requirements.
9. Avoid blocking dormers if possible. Windows to be replaced with wider style if possible.
10. Provide view of harbor as design allows from common area.

Furnishings, Fixtures and Equipment

	No.
Conference Room Table (seat 6)	1
Movable / Stackable Chairs	6
White Board + Mounting	1
Telephone	1
Sofa/Loveseat	1
Coffee Table/End Tables as space allows	
Lower Cabinetry with Built-in Sink (sized for space)	
Upper Cabinetry (sized for space)	
Microwave	1
ADA Compliant Refrigerator/Freezer (with water in door)	1
Coffee Maker	1
ADA Electric Oven and Cook top Range	1
ADA Compliant Dishwasher	1

SPACE AND ADJACENCY REQUIREMENTS

Summary – “Non – Assignable Spaces”

In addition to the assignable spaces described earlier in this chapter, the following non-assignable spaces should be provided as required.

IT Data / Telephone Closets (as required)

These closets should be designed according to typical standards and specifications, with sufficient conditioned air on a 24-hour basis. This room will provide infrastructure and support for all technology housed in the building. Please refer to Chapter Five for more detailed information. Equipment may be stored in Dry Lab area.

Mechanical Rooms

This space should be appropriately sized for air handlers, pumps, piping, etc. Also provide separate closet(s) for electrical panels and other necessary electrical equipment. Provide chases as needed.

Elevator

Elevators are generally required in all multi-story buildings to offer accessibility to the disabled. If accessible bunking accommodations can be provided on the first floor of the MOC an elevator will not be required in the building. This possibility will be examined further as design progresses. It is the preference of the site to avoid placing an elevator in the building if possible.

If absolutely necessary, an elevator will be added to the boathouse to provide accessibility to second floor visitor accommodations. The handicapped accessible elevator will be limited usage/limited application elevator with cable drive. Handicapped accessibility is required to the second floor in order to conform to the Architectural Barriers Act (ABA) section F206.2.3 because more than five people would use the second floor. Note that this differs from the Americans with Disabilities Act (ADA) requirements, which exclude floors of 3,000 SF or less. ABA is the code required for Federal facilities and ADA is not applicable.

Stairs

A new code compliant stairway to the second floor will be installed as part of this project. The stair should be easily accessible from the building entrance. To conform to fire codes, the stairway should exit directly to the exterior via a new door, necessitating a vestibule entry. This entry also provides security by allowing access to the second floor without accessing the first floor areas.

This chapter includes the initial technical requirements (architectural, structural, mechanical, electrical, etc.), required for the proper design and construction of the individual spaces listed in the space summary in the previous chapter. Many of the design considerations were developed during the planning charrette and have been included here to document these directives.

The information is intended as a guideline for preliminary design purposes only and does not include all regulations and requirements for proper design and function. The design architect should prepare a full code review.

The chapter is organized into the following sections:

- General Requirements
 - Codes and Regulations
 - Design Considerations
- Site Requirements
 - Site Diagram
- Storage Requirements
- Dive Locker Best Practices
- Preliminary Design Phase Schedule

SUPPORTING REQUIREMENTS

General Requirements

The information that follows is to be applied to the building design and construction as a whole. The requirements stated shall apply to all rooms within the MOC. The property is zoned as A-3 Residential and is in the Flood Plain and Watershed Protection District by the Town of Scituate.

Codes and Regulations

The design team shall prepare a written code and standards analysis for the project. Assure all applicable codes are reviewed; where there is a discrepancy, the more stringent shall apply.

At minimum, the following codes and regulations shall apply:

- International Building Code (IBC)
- International Mechanical Code
- National Electrical Code
- International Plumbing Code
- International Energy Conservation Code (IECC)
- National Fire Protection Association (NFPA) Codes
- NFPA 101 Life Safety Codes and including all referenced standards
- Architectural Barriers Act
- Environmental Protection Agency (EPA)
- Other Jurisdictions:
 - Occupational Safety and Health Administration (OSHA)
 - Town of Scituate/Scituate Inspection Department
 - Federal Emergency Management Agency (FEMA)/National Flood Insurance Program (NFIP)
 - Massachusetts State Building and Electrical Codes including applicable amendments

Design Considerations

Overall Building Design:

- Seawater occasionally reaches the underside of floor during inclement weather (the FEMA Flood Zone is 12'-0" and building floor is 11'-9" high). A watertight barrier will be installed around the building to prevent water seepage.
- The building is not on the historic register, but it is an iconic feature on Scituate Harbor. Any modifications need to be consistent with Coast Guard-type construction and architecture typical of the area and neighborhood.
- Consider maintenance costs associated with any specialized systems proposed for the project, such as solar panels, seawater re-circulations systems, and wind turbines.
- The building shall be accessible to the physically handicapped and shall comply with applicable ABA guidelines for new construction.
- Building design should incorporate low maintenance and energy efficient features. The project should be designed to LEED standards although registration and certification are not anticipated.

Architectural Considerations:

- For security purposes, all occupied rooms and associated workspaces shall be provided with a lock and key. Exterior doors should be provided with keypad entry.
- All occupied rooms shall have natural light. Avoid blocking windows and dormers whenever possible.
- Consider the effects of salt aerosols during design. All finishes should be corrosion-resistant.
- Convenience power (GFCI) and data outlets shall be provided along perimeter walls, paying special attention to possible locations for equipment and furniture.
- LEED is not being pursued, but the renovation will incorporate as many "Green" products as budget will allow.
- Consider using "green rock" moisture resistant drywall.
- Doors should be fiberglass to resist salt spray corrosion.
- NOAA wants to restore and accent the solid plank flooring on the buildings first floor.

Fire Protection:

- The upstairs "residential" occupancy will require a two-hour fire separation from the downstairs "factory" (due to the boat repairs occurring) occupancy.

SUPPORTING REQUIREMENTS

- Although not required by IBC, NFPA 101 or Massachusetts State Building Code the sprinkler system will be installed, operated and maintained in accordance with IBC Chapter Nine, the International Fire Code and NFPA 13.

Mechanical Design Considerations:

- The existing system is heating and ventilation only; this project will upgrade the systems to include air conditioning.
- New HVAC should be provided to serve the multipurpose room, dive locker, boat shop. A new package unit should be provided to the wet lab, dry lab, and second floor.
- Consider the use of passive heating and cooling methods to increase energy conservation.
- Fresh air shall be supplied and spaces ventilated in accordance with the International Mechanical Code.
- Provide temperature, humidity, and dust control in dry and wet labs. The building should be heated.

Electrical Design Considerations:

- Emergency and exit lighting shall be provided per NFPA 101 requirements.
- The building is fed by a 25kVA pole-mount transformer with a 120/240 V, single-phase, three-wire overhead service. Due to increased load requirements, service may need to be converted from overhead to underground. Coordinate with local electrical utility.
- The building currently has one electric meter. Multiple sub-meters were requested during planning to monitor major building loads. The existing meter should be upgraded due to increased load requirements.
- An existing wall-mounted 200 amp, 240V main service panel is located on the first floor of the southwest corner interior wall. The main panel will be upgraded due to increased load requirements.
- Existing duplex/quadruplex receptacles are installed throughout the building space and mounted 48-inches AFF. Most of the receptacles are not GFCI. New GFCI/AFCI receptacles will be installed to meet latest NEC code requirements.
- The National Renewable Energy Laboratory has previously analyzed the site and found that the south and west roof zones would be the best photovoltaic panel locations.

Lighting Design Considerations:

- 50-55fc required for general interior lighting.
- Lighting shall have motion sensors.

SUPPORTING REQUIREMENTS

- Lighting controls shall be located within close proximity to the room entry.
- Windows shall have blinds or darkening shades for control of natural light.

Plumbing Design Considerations:

- This project will add restrooms and showers to the Boathouse, which currently has no restroom facilities.
- A new fire sprinkler system will be installed throughout the building in accordance with NFPA 13. The sprinkler system is required to permit a single exit from the second story as allowed by NFPA 101, Section 28.2.4.2.
- Hot and cold water should be provided to the building.
- Where applicable, fixtures that utilize water conservation features shall be installed. Consider no flush urinals for men's restrooms.
- Provide seasonal (during warmer months only) cold water to the floating piers. Piers will be sprinklered in accordance with code.

IT/Communications/Security Design Considerations:

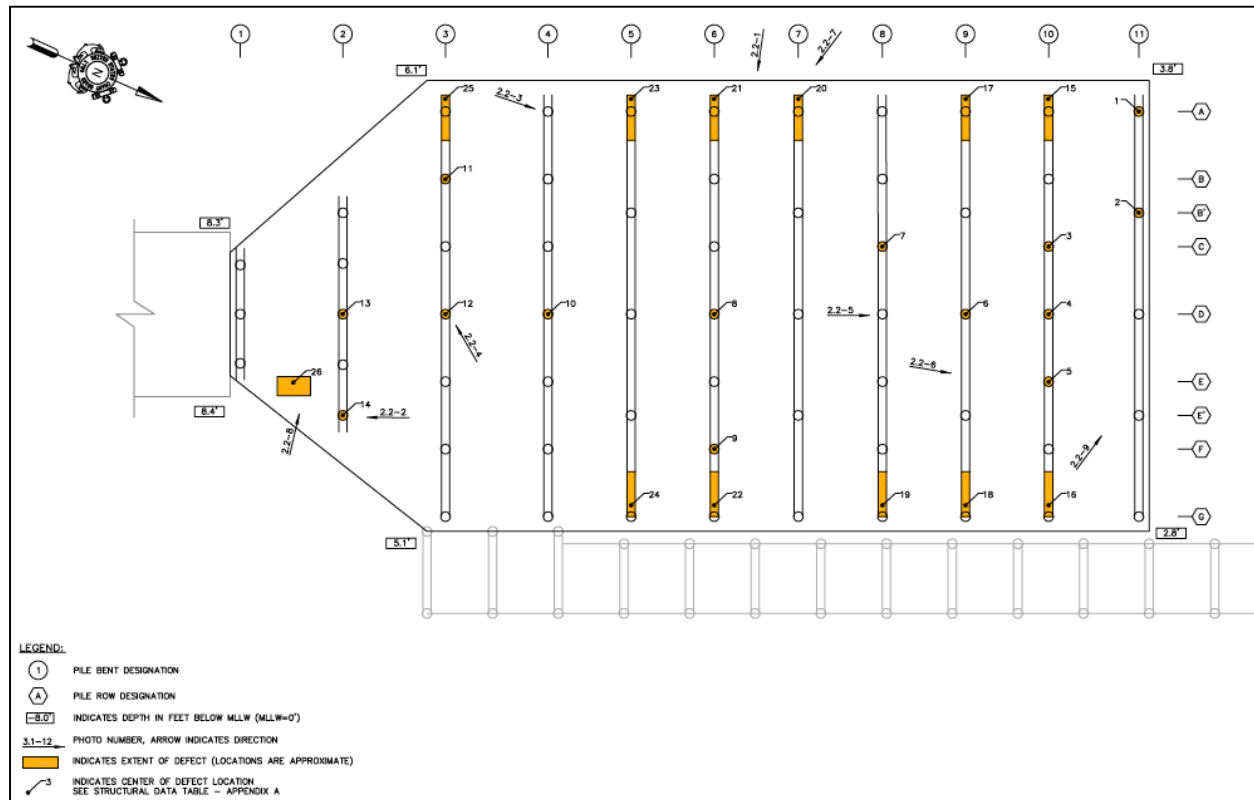
- Network server/IT cabinet required shall be in conditioned space.
- An existing fiber-optic line was installed by the Coast Guard and is currently being used for the existing CCTV camera. The fiber-optic line is routed overhead from the Boathouse to the Annex building. Any new CCTV cameras installed as part of the project will be monitored in the administrative building.
- Security cameras will be installed on the front and back of the boathouse building. There is an existing CCTV camera on the north side of the building, facing the pier. CCTV is not required on building interior spaces.
- Existing telecommunication and fiber-optic service drop sags over the driveway and bulkhead. SBNMS requested that the service line be relocated from the southeast corner to the southwest corner of the building to clear the driveway/bulkhead area.
- An existing telecomm cabinet is located on southeast corner of the Boathouse.
- Multiple data ports are required for each room to increase flexibility.
- Intrusion detection for windows on the first floor is required.
- CCTV for interior spaces is not required.

SUPPORTING REQUIREMENTS

Structural Design Considerations:

- The bulkhead is a 70-year old timber structure that is in serious need of renovation due to overstressed elements and general decay according to recent engineering reports. Rehabilitation is currently being performed under a separate contract in order to prevent complete failure of the structure, including replacement of approximately ten feet of timber bulkhead structure with concrete to prevent twisting and to stabilize the attached pier. The boathouse pier requires repair and/or replacement of the timber piles, pile caps and blocks that support the pier and boathouse structure. Specific problems include:
 - 14 split piles with splits up to one-inch wide. All 14 piles should be repaired.
 - Nine floor beams and blocks beneath the boathouse should be repaired.
 - A gap exists between one pile and pile cap – shim pile and cap.
 - 15 split pile caps and blocks. Six pile caps / blocks require repair and/or replacement.

Structural Repair Diagram:



This diagram shows the location of structural repairs. Diagram provided by Appledore Marine Engineering.

Site Requirements

Exterior Modifications

- Integrate the building into surrounding harbor landscape and utilize new landscape and site features that enhance building and site appearance from the public view. Consider some type of historic feature of the building to enhance the building's visual appeal on the harbor. Thought must be given to the neighbor's view when planning any exterior modifications.
- The building was repainted in 2010.
- Waterproofing should be added to the structure below the building to prevent water from infiltrating the building's interior.
- The site is generally public and provides good visibility to the sanctuary; however, it is a residential area and surrounding neighbors discourage visitor traffic. Additionally, openness can bring security issues. Opportunities to provide public educational features were discussed and should be planned carefully to consider both adjacent residences and visitor safety.

Parking Lot

- It is not recommended that asphalt be used. Permeable pavers are the preferred material for the new parking lot. Consider paver options that allow grass to grow in the lot to emphasize green space.
- A sidewalk is not required to the boathouse from the parking lot.
- Down lighting is preferred for the parking lot area so adjacent residential areas are minimally affected.
- Provide an ADA parking spot on the pier near the building.
- Parking spaces will be 9-foot by 18-foot minimum.
- Address drainage issues and ponding problem near the parking lot entrance with improved site grading.

Site Utilities

- A new freeze resistant domestic water line will be installed to provide ample water supply to the boathouse and pier.
- A connection to the town's sanitary sewage line is required, with a sump and alternating pumps. Other options will be explored if this is not possible due to neighborhood or city constraints.

SUPPORTING REQUIREMENTS

Site Lighting

- New lighting will be provided on the boathouse building. The lighting can be used to emphasize the building, but should not be disruptive to the neighbors. Pier and dock lighting will be provided in a future project phase.
- One important function of the exterior lighting system will be to clearly identify the site and building by using light in concert with the architecture of the building. The lighting of the building and pier may be used to give the building a nighttime identity.
- Fixtures employing cut-off optics in accordance with LEED standards should be selected to minimize spill light and reduce light pollution.

Site Diagram



Storage Requirements



Dive Equipment



Whale Tagging Poles



Inflatable Boat and Trailer

NMSS storage requirements are a consideration in any building project because of the size and uniqueness of many of the items stored by sanctuary sites. Since the boathouse is currently used for storage, the replacement or re-working of storage should be considered as part of the project. If certain stored items are affected by the renovation, a new storage space will need to be provided or considered in the layout of the design. Photographs have been provided on the following pages of the many items currently kept in the building.

Items to be stored include:

- Buoys, rope, and associated equipment.
- Dive tanks and equipment: Some of these could be kept in the new dive locker, but space is limited.
- Inflatable boat and trailer (Approximately 23'-6" long and 8' tall): Several solutions were discussed for this vessel, including hoisting it above the main workroom, but existing ceiling height would likely be restrictive and the hoist mechanism would add cost to the project. Hoisting the inflatable in this space may also affect the lighting and flexibility of uses. Alternatively, the boat could be stored in a covered area on the outside of the building.
- Two environmental police ATVs are currently stored in the boathouse. The plan for the vehicles was unknown at the time of the charrette as they are not owned by SBNMS, but they will most likely be moved elsewhere.
- Drum containers (approximately 3' tall by 1' diameter)
- Numerous boxes and plastic totes of various sizes.
- ROVs and AOVs
- Whale tagging poles
- Forklift: The possibility of overhead storage was discussed on the first floor, above the proposed dive locker and restroom. A forklift would be needed to place large or heavy items in this mezzanine level storage area.

The above list includes storage items noted during site tours. However, there may be additional storage needs not listed. Storage requirements should be reviewed in detail with the users to confirm that all needs are covered as design progresses. In addition to the items listed above, new storage will need to be provided for new boat repair and research items, along with lockable storage cages for individual researchers.

SUPPORTING REQUIREMENTS

SBNMS Stored Items:



Storage Drums



Dive tanks and equipment



Rope



AOV



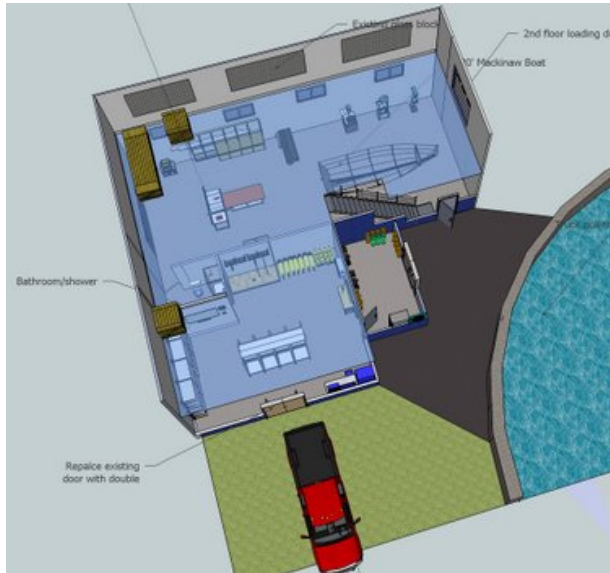
Buoys



Police ATVs

Dive Locker Best Practices

The MOC dive locker will support SBNMS dive operations year round. Dive lockers are becoming an important component of NOAA facilities, and the ONMS look to improve dive locker facilities by developing best practices related to dive locker design. Every space will be different according to program requirements, but several general design standards and parameters listed below can help to design dive lockers that are functional and efficient.



A diagram of the new dive locker that is envisioned at the Dive Center being planned at Thunder Bay National Marine Sanctuary. (Source: TBNMS)

- Easy to access storage system for wet suits, buoyancy compensators (BCs), and regulators. Storage should not only be easily accessed but also have adequate airflow for drying. Several storage methods should be accommodated, including shelving, hooks, bars for hanging equipment, and stackable bins. Circulation should be provided that allows people and equipment to pass around and through.
- Floor and wall space for items that cannot be stored in traditional storage methods including larger items and tanks. If heavy items are hung from walls, extra structural support may be required.
- Adequate drainage for wet gear is critical where wet suits are stored. Floor drains should be considered when appropriate.
- Hose bibbs should be provided both in the drying rack area and at an adjacent exterior location for gear rinsing.
- Humidity controls to encourage a low humidity environment that will prevent mold growth and dry rot indoors, improve comfort, and protect sensitive equipment from the adverse effects of excessive humidity.
- HVAC control with heating and cooling. Heating may be especially important during winter months. Increased ventilation is also required due to humidity and salt aerosols.
- Shower/rinse area for gear with an accessible toilet, lavatory, and shower.
- Exterior access is required with a wide door (4'-0" minimum). A loading area with room for a truck to pull in is often needed. Security of these areas should be controlled.
- A workbench for gear repair and a separate workbench for electronics with adequate tool storage.
- All finishes should be durable, corrosion resistant, and easy to clean. Flooring should be a sealed, non-slip surface.

SUPPORTING REQUIREMENTS

- Lockers/storage for personal gear that is lockable and allows air to circulate.
- Deep shelving to accommodate large crates/bins.
- Secured tank racks to prevent tanks from falling and/or rolling. Increased structural support may be required due to increased loads of tanks and equipment.

The following pages have pictures of benchmarking trips made by NOAA staff to dive lockers at the Georgia Aquarium and the Bodega Bay Marine Laboratory. The pictures present dive locker storage and other requirements that may aid the design of the dive locker for the MOC.

Tank Storage Examples:



Bodega Bay Marine Lab Cylinder Storage



Bodega Bay Tank Racks



Georgia Aquarium Tank Racks



Georgia Aquarium "tank truck" used to transport tanks

Wet Suit Racks / Gear Storage Examples:



Georgia Aquarium Wet Suit Racks



Georgia Aquarium wet suits and gear



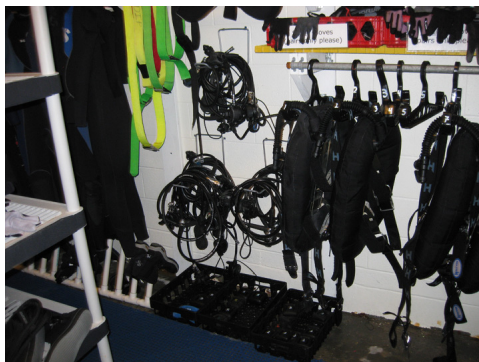
Georgia Aquarium Fin Holders



Georgia Aquarium Glove and Hood Storage



Georgia Aquarium Shelving System



Georgia Aquarium Regulators and Buoyancy Compensators Storage



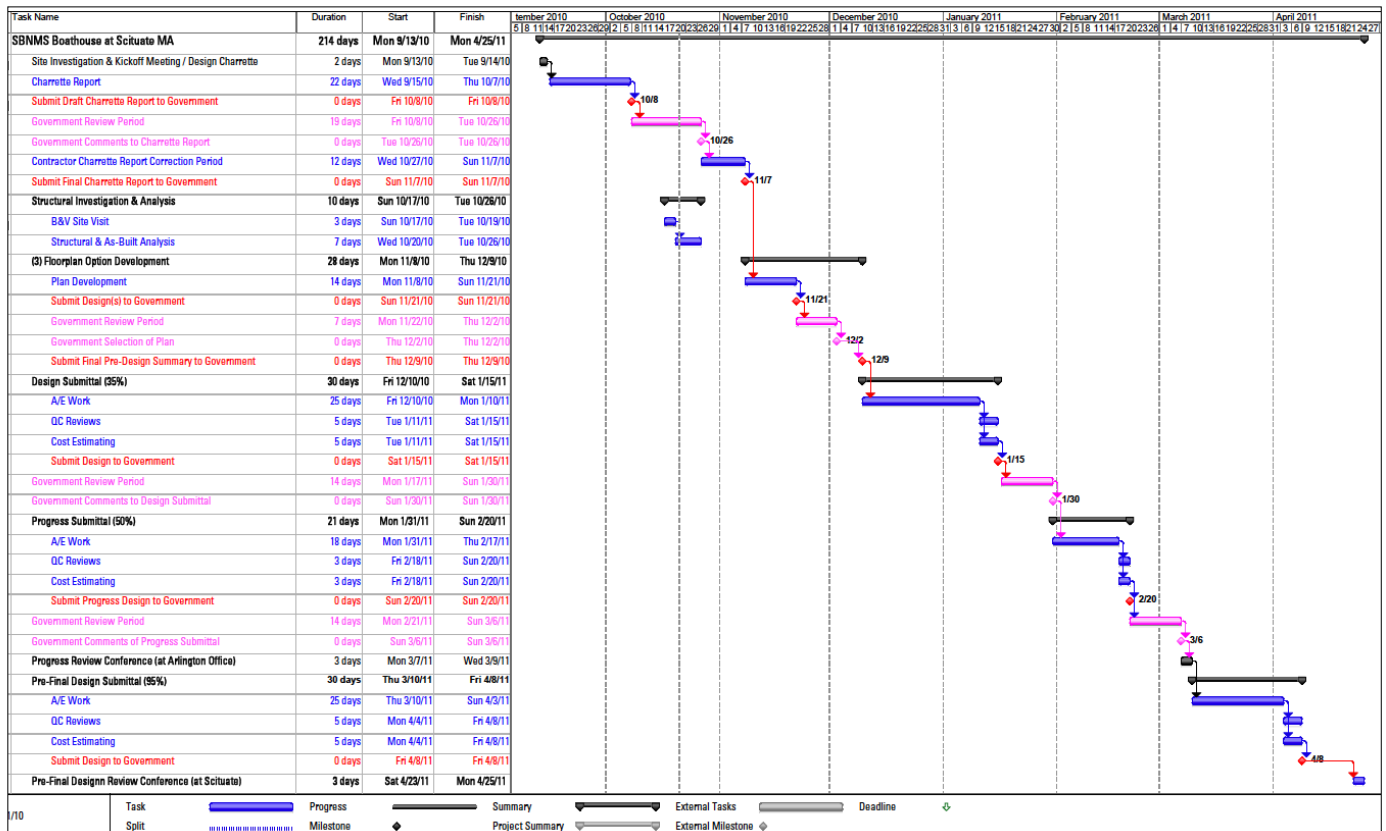
Georgia Aquarium Work Bench

SUPPORTING REQUIREMENTS

Preliminary Design Phase Schedule

The best way to keep a project on schedule is to diligently manage those items that can be controlled. The following schedule details the design phase of the boathouse renovation project. The schedule will be adjusted as needed as design progresses.

Once the charrette report is finalized, the Architects design the building based on the program requirements. The final step in the design process is the preparation of the Construction Documents, which include drawings, plans and specifications. The Architect and NOAA Project Manager are responsible for providing a Bidding and Construction Schedule.





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