MANATEE COUNTY
FLORIDA

April 21, 2011

TO: All Interested Bidders

SUBJECT: **Invitation for Bid # 11-1021-DS**
Coquina Concession Building Remodel (Project No. 49643)

ADDENDUM # 3

Bidders are hereby notified that this Addendum shall be acknowledged on pages 00300-1 of the Bid Form and made a part of the above named bidding and contract documents. Bids submitted without acknowledgement of the Addendum will be considered incomplete.

The following items are issued to add to, modify, and clarify the bid and contract documents. These items shall have the same force and effect as the original bidding and contract documents, and cost involved shall be included in the bid prices. Bids to be submitted on the specified bid date, shall conform to the additions and revisions listed herein.

The deadline for clarification of questions was **April 14, 2011 at 2:00 pm.** This deadline had been established to maintain fair treatment of all potential bidders, while maintaining the expedited nature of the Economic Stimulus that the contracting of this work may achieve. Questions received after this date and time shall not be considered.

The responses to the submitted questions have been provided by Mr. Dražen Ahmedić, AIA, Associate **SCHENKEL**SHULTZ.

1. Attachment: Memorandum dated April 20, 2011 (3 pages)
Subject of Attachment: Responses to submitted questions

Finance Management Department
Mailing Address: Purchasing Division: 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205
PHONE: 941-749-3045 * FAX: 941-749-3034
www.mymanatee.org

April 21-, 2011

Invitation for Bid # 11-1021-DS
Coquina Concession Building Remodel (Project No. 49643)
ADDENDUM # 3

If you have submitted a bid prior to receiving this addendum, you may request in writing that your original, sealed bid be returned to your firm. All sealed bids received will be opened on the date stated.

(A site inspection is a requirement to submit a bid) No bids will be considered without this requirement.

END OF ADDENDUM # 3

The deadline for submitting sealed Bids at the Manatee County Purchasing Division, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205.has been modified.

The Bid Opening date and time have been revised as noted below. The location remains the same.

FROM:	**April 22, 2011**	**3:00 pm**
TO:	**April 28, 2011**	**3:00 pm**

Sincerely,

R. C. "Rob" Cuthbert, CPM, CPPO
Purchasing Official

/ds
Attachments
1. EOR response letter dated 4.20,2011 (3 pages)
2. A012 Life Safety Sheet (1 page)
3. FEMA Technical Bulletin 2 dated August 2008 (22 pages)
4. Section 26 05 33 raceway and Boxes for Electrical Systems (13 pages)
5. Contractors Request for Substitution (2 pages)
6. Site Visit attendance sheets for 4/4/2011 and 4/12/2011

Finance Management Department
Mailing Address: Purchasing Division: 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205
PHONE: 941-749-3045 * FAX: 941-749-3034
www.mymanatee.org

SCHENKELSHULTZ
ARCHITECTURE

PROJECT NAME: **COQUINA BEACH CONCESSIONS BUILDING REMODELING**

Manatee County

ADDENDUM NUMBER 3

Date of Issue: April 20, 2011

Bidders are hereby notified that this Addendum shall be acknowledged on the Bid Form and made a part of the above named bidding and contract documents. Bids submitted without acknowledgement of the Addendum will be considered incomplete.
The following items are issued to add to, modify, and clarify the bid and contract documents. These items shall have the same force and effect as the original bidding and contract documents, and cost involved shall be included in the bid prices. Bids to be submitted on the specified bid date, shall conform to the additions and revisions listed herein.

Attachments:

- Life Safety Sheet A012
- FEMA Technical Bulletin 2 dated August 2008
- Sign In sheet for the site visit
- Project substitution request Plexi Quartz – Not accepted
- Adjusted spec section 26 05 33

Clarifications:

Clarification 1: All specified gypsum board for this project has been substituted with Water-Resistant, fiber-reinforced gypsum exterior sheathing. We will use this product for interior use and shall comply with table 2 of Technical Bulletin 2 dated August 2008.

Clarification 2: CBC license shall not be acceptable as an equal for GC license.

Clarification 3: Staging for the project shall be discussed and agreed upon at the pre-construction meeting with the successful bidder.

Clarification 4: Disposal of debris shall be done on a daily basis. Large dumpster shall not be allowed on site due to staging limitations and usage of the beach. Contractor shall clean the site daily per our specifications and construction waste shall be disposed of and moved from the site on daily basis.

Questions:

Question 1: I would like to request a copy of the sign in sheet from the mandatory pre-bid meeting that took place last April 4th at 9:00 am on site.
Answer: Sign in sheet for site visits is attached for your reference.

Question 2: Please clarify which demolition is the responsibility of the general contractor.
Answer: At the time of Notice To Proceed only the exterior walls will remain at the building site. Contractor shall be responsible for site demolition and any demolition required in the existing exterior walls to accommodate new construction. For example, interior demolition and roof demolition will be complete but demolition for new window and door openings in the existing exterior walls shall be responsibility of the contractor.

Question 3: Please note section 07 05 13 – 4 (d) "weathertightness warranty" (20 years). This warranty is only available with a standing seam (ss) roof system; however, the specifications call for a 5v crimp metal roof. please clarify.
Answer: 5v crimp metal roof shall be used. Finish shall match the existing bus shelter adjacent to the building site and the new pavilions. Delete weathertightness warranty requirement from the project scope, specifications section 07 40 13 – 4 paragraph D.

Question 4: Why would you not use sch 80 PVC conduit on all exterior underground conduits? The cost would be much less and would last forever.
Answer: Electrical Specification Section 260533 Raceways and Boxes allows the use of RNC in exterior underground conduits (direct buried) but only RMC/IMC for exterior above ground (exposed) conduits. See Electrical Specification Section 260533 attached.

Question 5: The interior wall outlets are spec to be surface mounted but the conduit is spec to be run concealed in walls. My question would be, Do you want to saw cut and notch all existing block walls to conceal the conduits? New walls would not be a problem.
Answer: See Revised Electrical Specification Section 260533 Raceways and Boxes Section 3.2C.for revised conduit and box installation criteria. See Electrical Specification Section 260533 attached.

Question 6: Plan page A601 – concerning windows, with new finished floor elevation, if top of tie beams are at 9' 4" new windows will cut into them. Will existing tie beams be demolished? Will new tie beams be needed?
Answer: Existing tie beam with 9'-4" top of beam elevation will have to be cut at new window openings. Per 7/S3.0 a new poured 8"x16" tie beam with 12'-4" top of beam elevation shall be

provided at all exterior walls. Reinforce new tie beam per schedule on S2.0. Refer to General Notes on S0.1 for lintels immediately above wall openings. Refer to Foundation Plan S1.0 for reinforced fill cells at edges of new exterior wall openings.

Question 7: Will new interior CMU wall (north/south) have tie beam?
Answer: At new non-load-bearing interior concrete block walls, provide single course bond beam with (1) #5 continuous.

Question 8: We have not found a finish schedule nor any notes concerning the room which are to receive the epoxy floor coating. Can you please include a finish schedule, notes or information as to which rooms are to receive the epoxy floor coating?
Answer: All rooms shall have epoxy floor coating and epoxy interior paint (walls and ceiling).

Above concludes Addendum No.3,

Dražen Ahmedić, AIA
Associate
SSA project #0920829

LIFE SAFETY PLAN LEGEND

SYMBOL	DESCRIPTION
— - —	EXIT TRAVEL DISTANCE
	EXIT SIGN
	SURFACE MOUNTED FIRE EXTINGUISHER W/ BRACKET @ 48" AFF
	BATTERY POWERED EMERGENCY LIGHTING UNIT

315 SF — SQUARE FOOTAGE
100 | 4 — OCCUPANTS
SQUARE FEET PER OCCUPANT

BUILDING DESIGN CRITERIA

AUTHORITIES HAVING JURISDICTION

State Fire Marshall
Manatee County Building Department
West Manatee Fire & Rescue

APPLICABLE CODES

Florida Building Code - Building - 2007 Edition w/ 2009 Supplements
Florida Fire Prevention Code - 2007 Edition w/ 2009 Supplements
NFPA 101 Life Safety Code - 2009 Edition
Florida Building Code - Accessibility - 2007 Edition w/ 2009 Supplements
Florida Building Code - Plumbing - 2007 Edition w/ 2009 Supplements
Florida Building Code - Mechanical - 2007 Edition w/ 2009 Supplements
National Electric Code - 2008 Edition

OCCUPANCY CLASSIFICATION
M Mercantile FBC Chapter 3

CONSTRUCTION TYPE
II-B - UnSprinklered FBC Chapter 6

ALLOWABLE AREAS
TABLE 503:
TOTAL ALLOWABLE PER FLOOR: (TABLE 503) 12,500 SQ. FT.
PROPOSED GROSS AREA: 1,300 SQ. FT.

ALLOWABLE STORIES/HEIGHT

	STORIES	HEIGHT
TABLE 503:		
TOTAL ALLOWABLE:	4	55 FT.
PROPOSED:	1	22 FT.

FIRE RATING REQUIREMENTS
BUILDING ELEMENTS: (FBC TABLE 601)
Structural Frame: 0 HR.
Exterior Bearing Walls: 0 HR.
Interior Bearing Walls: 0 HR.
Exterior Non-Bearing Walls: 0 HR.
Interior Non-Bearing Walls: 0 HR.
Floor/Ceiling Construction: 0 HR.
Roof/Ceiling Construction: 0 HR.

FINISH REQUIREMENTS
INTERIOR FINISHES (FBC TABLE 803.5)
Vertical Exits & Exit Passageways: Class B
Exit Access Corridors & Other Exitways: Class B
Rooms & Enclosed Spaces: Class C

OCCUPANCY TABLE TABLE 1004.1.1

	OCCUPANT LOAD
BUILDING:	
Mercantile Occupancy - 60 Sq. Ft. Per Person	16 Occupants
OUTDOOR PATIO:	
Unconcentrated (table and chairs) - 15 Sq. Ft. Per Person	165 Occupants

EGRESS REQUIREMENTS

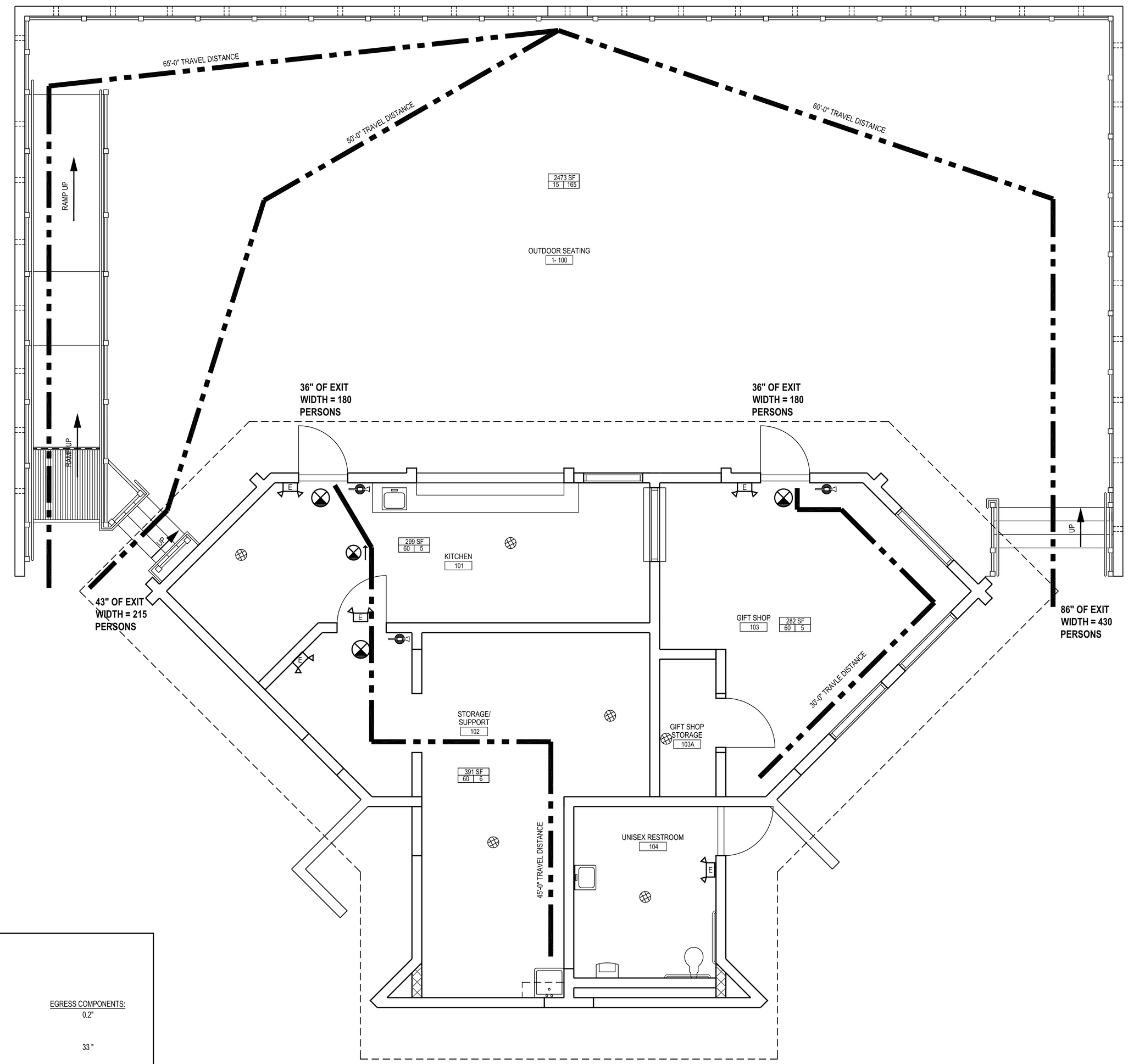
BUILDING:

	EGRESS COMPONENTS:
EGRESS WIDTH FACTORS: FBC TABLE 1005.1	0.2"
REQUIRED EGRESS WIDTH: 16 PERSONS x WIDTH FACTOR: 0.2 "	3.2 "
PROVIDED EGRESS WIDTH:	72 "
ALLOWABLE EXIT ACCESS TRAVEL DISTANCE:	Table 1015.1
Mercantile Occupancy UnSprinklered	150 FT.
PROVIDED EXIT ACCESS TRAVEL DISTANCE:	45 FT.
MINIMUM NUMBER OF EXITS: FBC Section 1018.1	2
PROVIDED NUMBER OF EXITS:	2

EGRESS REQUIREMENTS

OUTDOOR PATIO:

	EGRESS COMPONENTS:
EGRESS WIDTH FACTORS: FBC TABLE 1005.1	0.2"
REQUIRED EGRESS WIDTH: 165 PERSONS x WIDTH FACTOR: 0.2 "	33 "
PROVIDED EGRESS WIDTH:	129 "
ALLOWABLE EXIT ACCESS TRAVEL DISTANCE:	Table 1015.1
Mercantile Occupancy UnSprinklered	150 FT.
PROVIDED EXIT ACCESS TRAVEL DISTANCE:	65 FT.
MINIMUM NUMBER OF EXITS: FBC Section 1018.1	2
PROVIDED NUMBER OF EXITS:	2



SCHENKELSHULTZ
ARCHITECTURE
677 North Washington Blvd.
Sarasota, Fl 34236
voice 941.952.5875
fax 941.957.3630
schenkelshultz.com
SS Lic No - AA-C000937

Architectural
Dražen Ahmešić
AR 94855

Coquina Beach

2650 Gulf Drive South
Bradenton, Florida 34217

Concessions Building Renovations

Manatee County Government
1112 Manatee Avenue West
Bradenton, Florida 34208

revisions:
1 02.08.2011 PERMIT COMMENTS

drawn: Jr
checked: Da
date: 10.22.2010
comm. no.: 0920829

LIFE SAFETY PLAN

1
A012
Permit drawings

Flood Damage-Resistant Materials Requirements

for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program

Technical Bulletin 2 / August 2008

FEMA

Table of Contents

Comments on the Technical Bulletins should be directed to:

Department of Homeland Security
FEMA Mitigation Directorate
500 C Street, SW.
Washington, D.C. 20472

Technical Bulletin 2-08 replaces Technical Bulletin 2-93, *Flood-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program.*

Introduction

Protecting buildings that are constructed in special flood hazard areas (SFHAs) from damage caused by flood forces is an important objective of the National Flood Insurance Program (NFIP). In support of this objective, the NFIP regulations include minimum building design criteria that apply to new construction, repair of substantially damaged buildings, and substantial improvement of existing buildings in SFHAs. The base flood is used to delineate SFHAs on Flood Insurance Rate Maps (FIRMs) prepared by the NFIP. The base flood is the flood that has a 1-percent chance of being equaled or exceeded in any given year (commonly called the "100-year" flood). Certain terms used in this Technical Bulletin are defined in the Glossary.

Under the NFIP, the "lowest floor" is the floor of the lowest enclosed area of a building. An unfinished or flood-resistant enclosure that is used solely for parking of vehicles, building access, or storage is not the lowest floor, provided the enclosure is built in compliance with applicable requirements.

As used by the NFIP, an "enclosure" is an area that is enclosed on all sides by walls.

The NFIP defines a "basement" as any area that is below-grade on all sides. The regulations do not allow basements to extend below the BFE.

The NFIP regulations require the use of construction materials that are resistant to flood damage. The lowest floor of a residential building must be elevated to or above the base flood elevation (BFE), while the lowest floor of a non-residential building must be elevated to or above the BFE or dry floodproofed to the BFE.

All construction below the BFE is susceptible to flooding and must consist of flood damage-resistant building materials. The purpose of this Technical Bulletin is to provide current guidance on what constitute "materials resistant to flood damage" and how and when these materials must be used to improve a building's ability to withstand flooding.

Table 1 describes five classes of materials ranging from those that are highly resistant to floodwater damage, to those that have no resistance to flooding. Materials are broadly described as structural materials and finish materials based on how they are used in normal construction practices. Table 2 lists materials by generic names, and notes whether the materials are acceptable or unacceptable for use below the BFE. All building materials are in some way fastened or connected to the structure. Fasteners and connectors, as described in this Technical Bulletin, also must be resistant to flood damage.

A brief description of the process used to identify or determine whether the materials listed are flood damage-resistant is provided, followed by some simplified examples with diagrams to illustrate the use of these materials below the BFE. Three additional circumstances where flood damage-resistant materials are used or recommended are described: accessory structures, limited use of wet floodproofing, and buildings outside of SFHAs.

Questions about use of flood damage-resistant materials should be directed to the appropriate local official, NFIP State Coordinating Office, or one of the Federal Emergency Management Agency's (FEMA's) Regional Offices.

NFIP Regulations

The NFIP regulations for flood damage-resistant materials are codified in Title 44 of the Code of Federal Regulations, in Section 60.3(a)(3), which states that a community shall:

> *"Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a floodprone area, all new construction and substantial improvements shall...(ii) be constructed with materials resistant to flood damage..."*

Proposals for substantial improvement of existing buildings in SFHAs, and proposals to repair those that have sustained substantial damage, must comply with the requirements for new construction. As part of issuing permits, community officials must review such proposals to determine whether they comply with the requirements, including the use of flood damage-resistant materials. Refer to the "Classification of Flood Damage-Resistant Materials" section of this Technical Bulletin for additional details. Further information on substantial improvement and substantial damage is found in *Answers to Questions About Substantially Damaged Buildings* (FEMA 213).

The NFIP Technical Bulletins provide guidance on the minimum requirements of the NFIP regulations. Community or State requirements that exceed those of the NFIP take precedence. Design professionals should contact the community to determine whether more restrictive provisions apply to the building or site in question. All other applicable requirements of the State or local building codes must also be met for buildings in all flood hazard areas.

Required Use of Flood Damage-Resistant Materials

Flood Damage-Resistant Material

"Flood [damage]-resistant material" is defined by the NFIP as "any building product [material, component or system] capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage." The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than cosmetic repair. "Cosmetic repair" includes cleaning, sanitizing, and resurfacing (e.g., sanding, repair of joints, repainting) of the material. The cost of cosmetic repair should also be less than the cost of replacement of affected materials and systems. In addition to these requirements, individual materials that are considered flood damage-resistant must not cause degradation of adjacent materials or the systems of which the material is a part.

The *International Building Code®* (IBC®), by reference to ASCE 24 *Flood Resistant Design and Construction*, and the *International Residential Code®* (IRC®), require the use of flood damage-resistant materials.

All building materials below the BFE must be flood damage-resistant, regardless of the expected or historic flood duration. For example, buildings in coastal areas that experience relatively short-duration flooding (generally, flooding with a duration of less than 24 hours) must be constructed with flood damage-resistant materials below the BFE. As noted in Table 2, **only Class 4 and Class 5 materials are acceptable for areas below the BFE in buildings in SFHAs**.

In some instances, materials that are not flood damage-resistant materials, such as wiring for fire alarms and emergency lighting, are allowed below the BFE if specifically required to address life safety and electric code requirements for building access and storage areas.

How Flood Damage-Resistant Materials Affect Flood Insurance Rates

Careful attention to compliance with the NFIP regulations for flood damage-resistant materials is important during design, plan review, construction, and inspection. Compliance influences both the building's vulnerability to flood damage and the cost of NFIP flood insurance. Flood insurance will not pay a claim for finish materials located in basements or in enclosed areas below the lowest floor of elevated buildings, even if such materials are considered to be flood damage-resistant. NFIP claims for damage below the BFE are limited to utilities and equipment, such as furnaces and water heaters.

Classification of Flood Damage-Resistant Materials

The information in this Technical Bulletin was initially developed based on information in the U.S. Army Corps of Engineers' *Flood Proofing Regulations* (1995), and has been updated based on additional information from FEMA-funded studies and reports, technical experts, and industry and trade groups. Table 1 classifies building materials according to their ability to resist flood damage.

Table 1. Class Descriptions of Materials

NFIP	Class	Class Description
ACCEPTABLE	5	Highly resistant to floodwater[1] damage, including damage caused by moving water.[2] These materials can survive wetting and drying and may be successfully cleaned after a flood to render them free of most harmful pollutants.[3] Materials in this class are permitted for partially enclosed or outside uses with essentially unmitigated flood exposure.
	4	Resistant to floodwater[1] damage from wetting and drying, but less durable when exposed to moving water.[2] These materials can survive wetting and drying and may be successfully cleaned after a flood to render them free of most harmful pollutants.[3] Materials in this class may be exposed to and/or submerged in floodwaters in interior spaces and do not require special waterproofing protection.
UNACCEPTABLE	3	Resistant to clean water[4] damage, but not floodwater damage. Materials in this class may be submerged in clean water during periods of flooding. These materials can survive wetting and drying, but may not be able to be successfully cleaned after floods to render them free of most[3] harmful pollutants.
	2	Not resistant to clean water[4] damage. Materials in this class are used in predominantly dry spaces that may be subject to occasional water vapor and/or slight seepage. These materials cannot survive the wetting and drying associated with floods.
	1	Not resistant to clean water[4] damage or moisture damage. Materials in this class are used in spaces with conditions of complete dryness. These materials cannot survive the wetting and drying associated with floods.

Notes:

1. Floodwater is assumed to be considered "black" water; black water contains pollutants such as sewage, chemicals, heavy metals, or other toxic substances that are potentially hazardous to humans.

2. Moving water is defined as water moving at low velocities of 5 feet per second (fps) or less. Water moving at velocities greater than 5 fps may cause structural damage to building materials.

3. Some materials can be successfully cleaned of most of the pollutants typically found in floodwater. However, some individual pollutants such as heating oil can be extremely difficult to remove from uncoated concrete. These materials are flood damage-resistant except when exposed to individual pollutants that cannot be successfully cleaned.

4. Clean water includes potable water as well as "gray" water; gray water is wastewater collected from normal uses (laundry, bathing, food preparation, etc.).

MODIFIED FROM: USACE 1995 *Flood Proofing Regulations*

Table 2 lists structural materials and finish materials commonly used in construction of floors, walls, and ceilings. For the purpose of this Technical Bulletin, structural materials and finish materials are defined as follows:

- **Structural materials** include all elements necessary to provide structural support, rigidity, and integrity to a building or building component. Structural materials include floor slabs, beams, subfloors, framing, and structural building components such as trusses, wall panels, I-joists and headers, and interior/exterior sheathing.

- **Finish materials** include all coverings, finishes, and elements that do not provide structural support or rigidity to a building or building component. Finish materials include floor coverings, wall and ceiling surface treatments, insulation, cabinets, doors, partitions, and windows.

Notes Regarding Classification of Materials

The classifications in Table 2 are based on the best information available at the time of publication. However, flood damage-resistance is determined by factors that may be a function of the specific application and by the characteristics of the floodwaters. Each situation requires sound judgment and knowledge of probable contaminants in local floodwaters to select materials that are required to resist flood damage. For materials and products that are listed in Table 2, manufacturers' use and installation instructions must be followed to ensure maximum performance. Masonry and wood products used below the BFE must comply with the applicable standards published by the American Society for Testing and Materials (ASTM), the American Concrete Institute (ACI), the Truss Plate Institute (TPI), the American Forest & Paper Association (AF&PA), and other appropriate organizations.

1. **Materials Not Listed:** Table 2 does not list all available structural materials and finish materials. For materials and products not listed, manufacturers' literature (i.e., specifications, materials safety data sheets, test reports) should be evaluated to determine if the product meets flood damage-resistance requirements. Materials and products that are not listed in Table 2 may be used if accepted by the local official. Acceptance should be based on sufficient evidence, provided by the applicant, that the materials proposed to be used below the BFE will resist flood damage without requiring more than cosmetic repair and cleaning.

2. **Unacceptable Materials:** Class 1, 2, and 3 materials are unacceptable for below-BFE applications for one or more of the following reasons:

   - Normal adhesives specified for above-grade use are water soluble or are not resistant to alkali or acid in water, including groundwater seepage and vapor.

   - The materials contain wood or paper products, or other materials that dissolve or deteriorate, lose structural integrity, or are adversely affected by water.

   - Sheet-type floor coverings (linoleum, rubber tile) or wall coverings (wallpaper) restrict drying of the materials they cover.

   - Materials are dimensionally unstable.

   - Materials absorb or retain excessive water after submergence.

3. **Impact of Material Combinations:** In some cases, the combination of acceptable structural and finish materials can negatively impact the classification of individual materials. This is illustrated by the following examples:

- Vinyl tile with chemical-set adhesives is an acceptable finish flooring material when placed on a concrete structural floor. However, when the same vinyl tile is applied over a plywood structural floor, it is no longer considered acceptable because the vinyl tile must be removed to allow the plywood to dry.

- Polyester-epoxy or oil-based paints are acceptable wall finishes when applied to a concrete structural wall. However, when the same paint is applied to a wood wall, it is no longer considered acceptable. Recent FEMA-supported studies by Oak Ridge National Laboratory have found that low-permeability paint can inhibit drying of the wood wall.

4. **Impact of Long-Duration Exposure and/or Contaminants:** The classifications of materials listed in Table 2 do not take into account the effects of long-duration exposure to floodwaters or contaminants carried by floodwaters. This is illustrated by the following examples:

   - Following Hurricane Katrina, FEMA deployed a Mitigation Assessment Team (MAT) to examine how building materials performed after long-duration exposure (2 to 3 weeks) to floodwaters (FEMA 549). The field survey revealed that some materials absorbed floodborne biological and chemical contaminants. However, it is not known at this time if a shorter duration flood event would have significantly altered the absorption rates of those contaminants.

   - Building owners, design professionals, and local officials should consider potential exposure to floodborne contaminants when selecting flood damage-resistant materials. For example, Table 2 lists cast-in-place concrete, concrete block, and solid structural wood (2x4s, etc.), as acceptable flood damage-resistant materials. However, experience has shown that buildings with those materials can be rendered unacceptable for habitation after being subjected to floodwaters with significant quantities of petroleum-based products such as home heating oil. Commonly used cleaning and remediation practices do not reduce the "off-gassing" of volatile hydrocarbons from embedded oil residues to acceptable levels that are established by the U.S. Environmental Protection Agency. Other materials, when exposed to these types of contaminants, may also not perform acceptably as flood damage-resistant materials.

Table 2. Types, Uses, and Classifications of Materials

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Structural Materials (floor slabs, beams, subfloors, framing, and interior/exterior sheathing)							
Asbestos-cement board		■	■				
Brick							
Face or glazed		■	■				
Common (clay)		■		■			
Cast stone (in waterproof mortar)		■	■				
Cement board/fiber-cement board		■	■				
Cement/latex, formed-in-place	■			■			
Clay tile, structural glazed		■	■				
Concrete, precast or cast-in-place	■	■	■				
Concrete block[1]		■	■				
Gypsum products							
Paper-faced gypsum board		■			■		
Non-paper-faced gypsum board		■		■			
Greenboard		■				■	
Keene's cement or plaster		■			■		
Plaster, otherwise, including acoustical		■				■	
Sheathing panels, exterior grade		■			■		
Water-resistant, fiber-reinforced gypsum exterior sheathing		■		■			
Hardboard (high-density fiberboard)							
Tempered, enamel or plastic coated		■				■	
All other types		■					■
Mineral fiberboard		■					■
Oriented-strand board (OSB)							
Exterior grade	■	■				■	
Edge swell-resistant OSB	■	■				■	
All other types	■	■					■
Particle board	■						■
Plywood							
Marine grade	■	■	■				
Preservative-treated, alkaline copper quaternary (ACQ) or copper azole (C-A)	■	■		■			

Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Structural Materials (floor slabs, beams, subfloors, framing, and interior/exterior sheathing)							
Preservative-treated, Borate[2]	■	■	■				
Exterior grade/Exposure1 (WBP – weather and boil proof)	■	■		■			
All other types	■	■					■
Recycled plastic lumber (RPL)							
Commingled, with 80-90% polyethylene (PE)	■		■				
Fiber-reinforced, with glass fiber strands	■		■				
High-density polyethylene (HDPE), up to 95%	■		■				
Wood-filled, with 50% sawdust or wood fiber	■				■		
Stone							
Natural or artificial non-absorbent solid or veneer, waterproof grout	■	■	■				
All other applications		■				■	
Structural Building Components							
Floor trusses, wood, solid (2x4s), decay-resistant or preservative-treated	■	■		■			
Floor trusses, steel[3]	■		■				
Headers and beams, solid (2x4s) or plywood, exterior grade or preservative-treated		■		■			
Headers and beams, OSB, exterior grade or edge-swell resistant		■				■	
Headers and beams, steel[3]		■	■				
I-joists	■					■	
Wall panels, plywood, exterior grade or preservative-treated		■		■			
Wall panels, OSB, exterior grade or edge-swell resistant		■				■	
Wall panels, steel[3]		■		■			

Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Structural Materials (floor slabs, beams, subfloors, framing, and interior/exterior sheathing)							
Wood							
Solid, standard, structural (2x4s)		■		■			
Solid, standard, finish/trim		■			■		
Solid, decay-resistant[4]	■	■	■				
Solid, preservative-treated, ACQ or C-A		■		■			
Solid, preservative-treated, Borate[2]		■		■			
Finish Materials (floor coverings, wall and ceiling finishes, insulation, cabinets, doors, partitions, and windows)							
Asphalt tile[5]							
With asphaltic adhesives	■				■		
All other types	■						■
Cabinets, built-in							
Wood		■				■	
Particle board		■					■
Metal[3]		■		■			
Carpeting	■						■
Ceramic and porcelain tile							
With mortar set	■	■		■			
With organic adhesives	■	■				■	
Concrete tile, with mortar set	■		■				
Corkboard		■				■	
Doors							
Wood, hollow		■				■	
Wood, lightweight panel construction		■				■	
Wood, solid		■				■	
Metal, hollow[3]		■		■			
Metal, wood core[3]		■		■			
Metal, foam-filled core[3]		■		■			
Fiberglass, wood core		■		■			
Epoxy, formed-in-place	■		■				

Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Finish Materials (floor coverings, wall and ceiling finishes, insulation, cabinets, doors, partitions, and windows)							
Glass (sheets, colored tiles, panels)		■		■			
Glass blocks		■	■				
Insulation							
Sprayed polyurethane foam (SPUF) or closed-cell plastic foams	■	■	■				
Inorganic – fiberglass, mineral wool: batts, blankets, or blown	■	■			■		
All other types (cellulose, cotton, open-cell plastic foams, etc.)	■	■				■	
Linoleum	■						■
Magnesite (magnesium oxychloride)	■						■
Mastic felt-base floor covering	■						■
Mastic flooring, formed-in-place	■		■				
Metals, non-ferrous (aluminum, copper, or zinc tiles)		■			■		
Metals							
Non-ferrous (aluminum, copper, or zinc tiles)		■			■		
Metals, ferrous[3]		■		■			
Paint							
Polyester-epoxy and other oil-based waterproof types		■		■			
Latex		■		■			
Partitions, folding							
Wood		■				■	
Metal[3]		■		■			
Fabric-covered		■					■
Partitions, stationary (free-standing)							
Wood frame		■		■			
Metal[3]		■		■			
Glass, unreinforced		■		■			
Glass, reinforced		■		■			
Gypsum, solid or block		■					■

Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Finish Materials (floor coverings, wall and ceiling finishes, insulation, cabinets, doors, partitions, and windows)							
Polyurethane, formed-in-place	■		■				
Polyvinyl acetate (PVA) emulsion cement	■						■
Rubber							
Moldings and trim with epoxy polyamide adhesive or latex-hydraulic cement		■		■			
All other applications		■					■
Rubber sheets or tiles[5]							
With chemical-set adhesives[6]	■		■				
All other applications	■						■
Silicone floor, formed-in-place	■		■				
Steel (panels, trim, tile)							
With waterproof adhesives[3]		■	■				
With non-waterproof adhesives		■				■	
Terrazo	■			■			
Vinyl asbestos tile (semi-flexible vinyl)[5]							
With asphaltic adhesives	■		■				
All other applications	■						■
Vinyl sheets or tiles (coated on cork or wood product backings)	■						■
Vinyl sheets or tiles (homogeneous)[5]							
With chemical-set adhesives[6]	■			■			
All other applications	■						■
Wall coverings							
Paper, burlap, cloth types		■					■
Vinyl, plastic, wall paper		■					■
Wood floor coverings							
Wood (solid)	■						■
Engineered wood flooring	■					■	
Plastic laminate flooring	■					■	
Wood composition blocks, laid in cement mortar	■					■	
Wood composition blocks, dipped and laid in hot pitch or bitumen	■					■	

Notes:

1 Unfilled concrete block cells can create a reservoir that can hold water following a flood, which can make the blocks difficult or impossible to clean if the floodwaters are contaminated.

2 Borate preservative-treated wood meets the NFIP requirements for flood damge-resistantce; however, the borate can leach out of the wood if the material is continuously exposed to standing or moving water.

3 Not recommended in areas subject to salt-water flooding.

4 Examples of decay-resistant lumber include redwood, cedar, and black locust. Refer to Section 2303 of the International Building Code (IBC) and Section R324 of the International Residential Code (IRC) for guidance.

5 Using normally specified suspended flooring (i.e., above-grade) adhesives, including sulfite liquor (lignin or "linoleum paste"), rubber/asphaltic dispersions, or "alcohol" type resinous adhesives (culmar, oleoresin).

6 Examples include epoxy-polyamide adhesives or latex-hydraulic cement.

Fasteners and Connectors

The term "fasteners" typically refers to nails, screws, bolts, and anchors. The term "connectors" typically refers to manufactured devices used to connect two or more building components. Joist hangers, post bases, hurricane ties and clips, and mud-sill anchors are examples of connectors. Fasteners and connectors are materials and thus must be made of flood damage-resistant materials in order to comply with the NFIP requirements.

Specifications for fasteners and connectors used in buildings in SFHAs are in ASCE 24, a standard referenced by the IBC. Chapter 23 of the IBC has specific requirements for connections and fasteners used with wood, including preservative-treated wood. Similar specifications are in Chapter 3 of the IRC.

Table 2 does not specifically address fasteners and connectors. However, it is clear that the performance of buildings that are exposed to flooding is, at least in part, a function of the fasteners and connectors used to put the components together. When preservative-treated woods are used, particular attention is required for fasteners and connectors because some treatments are more corrosive than others, which could shorten the service life of the fasteners and connectors. For example, alkaline copper quaternary (ACQ) treatments are more corrosive than traditional acid copper chromate (ACC) treatments. If corrosion occurs, buildings are less likely to withstand flood loads and other loads. Fasteners and connectors made of stainless steel, hot-dipped zinc-coated galvanized steel, silicon bronze, or copper are recommended for use with preservative-treated wood.

This Technical Bulletin, consistent with ASCE 24 and the International Code Series, recommends that stainless steel or hot-dip galvanized fasteners and connectors be used below the BFE in both inland (noncorrosive) and coastal (corrosive) areas. In coastal environments where airborne salts contribute to corrosion, it is recommended that corrosion-resistant fasteners and connectors be used throughout the building where they may be exposed. For additional guidance, see Technical Bulletin 8, *Corrosion Protection for Metal Connectors in Coastal Areas.* Also see TPI/WTCA *Guidelines for Use of Alternative Preservative Treatments with Metal Connector Plates* for further guidance on metal plate connected wood trusses manufactured with preservative treated lumber (http://www.sbcindustry.com/images/PTWGuidelines.pdf).

Construction Examples

Buildings in Zones A, AE, A1-A30, AR, AO, and AH

Figure 1 illustrates a solid foundation wall (crawlspace) elevated to meet the minimum requirement that the lowest floor be at the BFE. Figure 2 illustrates framed walls that may be used for enclosures below the BFE that are used for parking of vehicles, building access, and storage.

To maximize allowable use of enclosures below the BFE, it is a common practice to extend the foundation a full story, even though that puts the lowest floor well above the BFE. In such cases, while the NFIP requirement is that flood damage-resistant materials be used only below the BFE, it is strongly recommended that such materials be used for all construction below the lowest floor. This will reduce flood damage to the enclosed area in the event flooding exceeds the BFE. For additional guidance on enclosures in A zones, see Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas.*

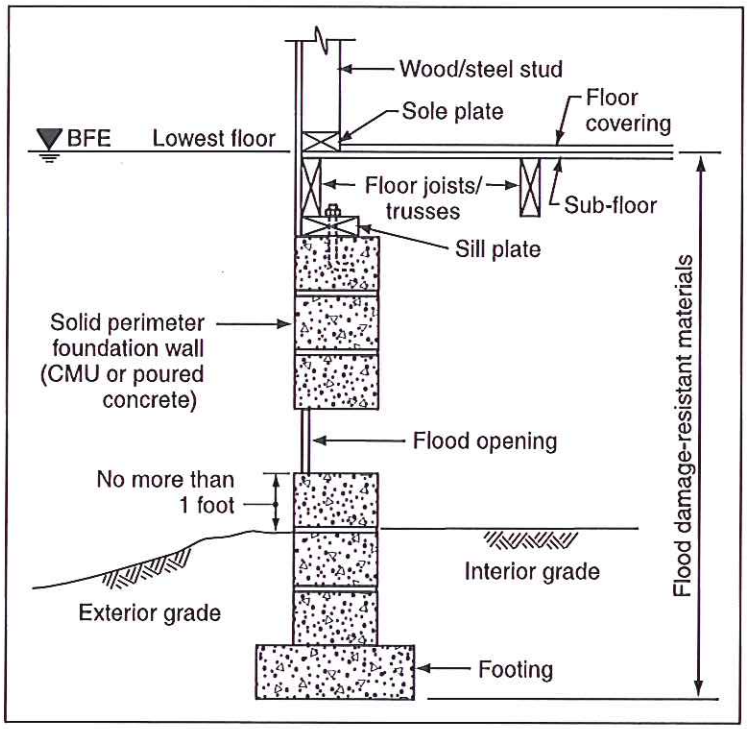


Figure 1. Building elevated on solid foundation walls meeting the minimum NFIP requirements for Zones A, AE, A1-A30, AR, AO, and AH

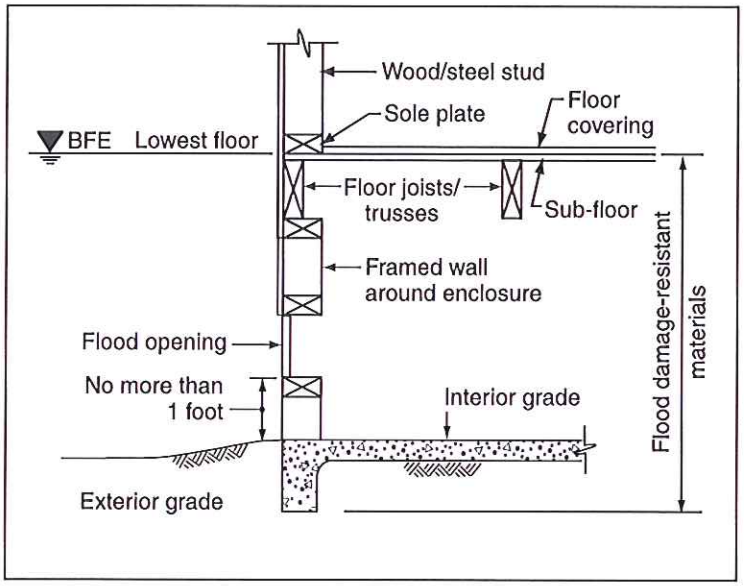


Figure 2. Framed enclosure under building elevated in accordance with NFIP requirements for Zones A, AE, A1-A30, AO, and AH

Buildings in Zones V, VE, and V1-V30

The NFIP regulations require that the bottom of the lowest horizontal structural member of the lowest floor (usually the floor beam or girder) of buildings in Zones V, VE, and Vl-V30 be at or above the BFE. Therefore, all materials below the bottom of those members must be flood damage-resistant materials. This requirement applies to lattice work and screening, and also to materials used to construct breakaway walls that enclose areas below the lowest floor. Depending on the design parameters selected, breakaway walls may remain in place during low-level floods and must be flood damage-resistant so that they can be readily cleaned and not deteriorate over time due to wetting. Figure 3 illustrates the requirement. For additional guidance on breakaway walls used to enclose areas under buildings in V zones, see Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings.*

Additional Uses of Flood Damage-Resistant Materials

Accessory Structures

Accessory structures may be allowed in SFHAs provided they are located, installed, and constructed in ways that comply with NFIP requirements. Some communities allow accessory structures that are limited to the uses specified for enclosures below the BFE: parking of vehicles and storage. As with other buildings, accessory structures below the BFE are required to be constructed with flood damage-resistant materials. In addition, accessory structures must be anchored to resist flotation, collapse, and lateral movement and comply with other requirements based on the flood zone. For additional information and requirements, contact the appropriate community permitting office.

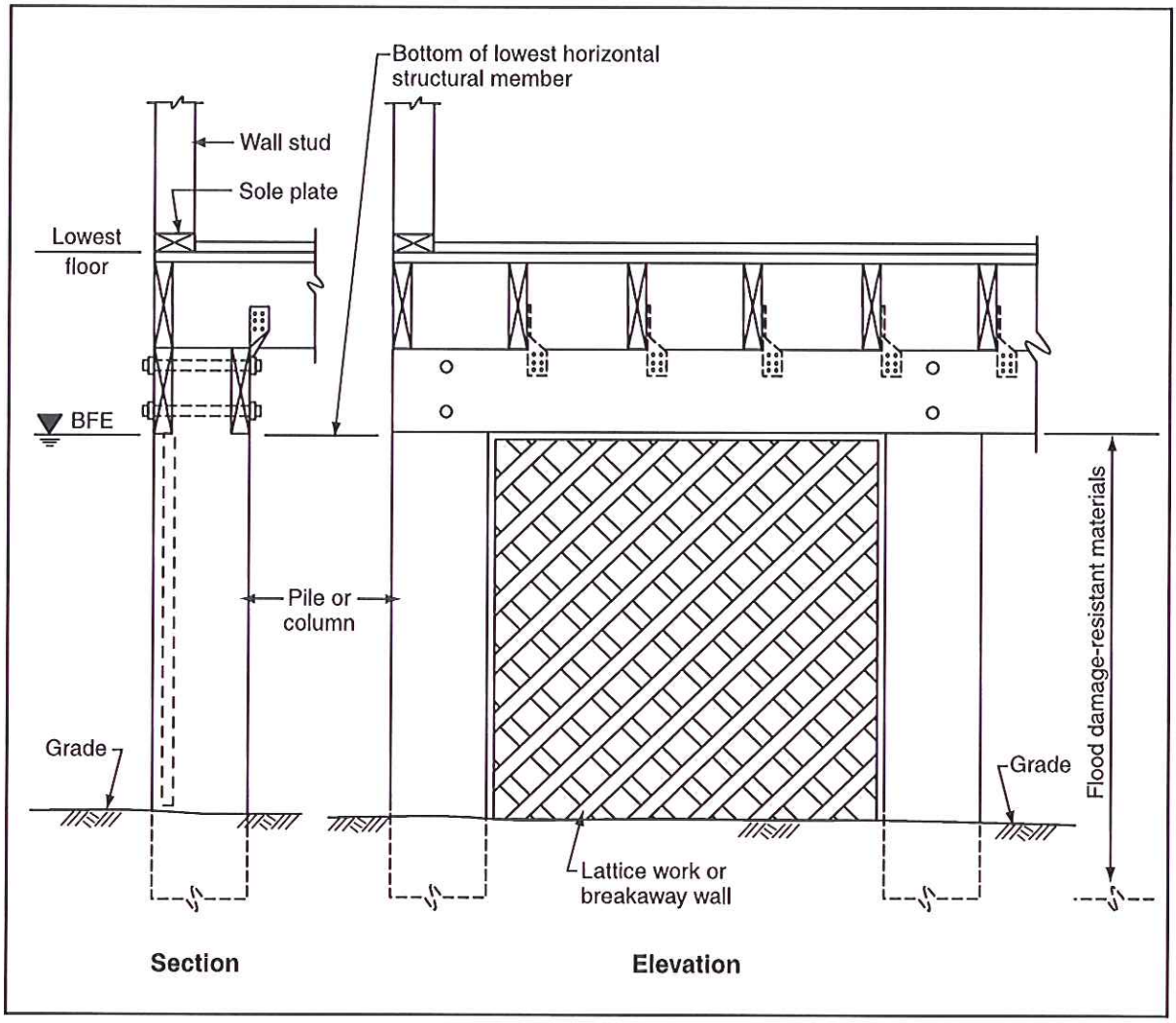


Figure 3. Flood damage-resistant building material requirements for buildings elevated in accordance with NFIP requirements for Zones V, VE, and V1-V30

Wet Floodproofing

Wet floodproofing is a method to reduce damage that typically involves three elements: allowing floodwaters to enter and exit to minimize structural damage, using flood damage-resistant materials, and elevating utility service and equipment. When a building is retrofitted to be wet floodproofed, non-flood damage-resistant materials that are below the BFE should be removed and replaced with flood damage-resistant materials. This will reduce the costs of repair and facilitate faster recovery.

Wet floodproofing is not allowed in lieu of complying with the lowest floor elevation requirements for new residential buildings (or dry floodproofing of nonresidential buildings in A zones). The exception is accessory structures, as noted on the previous page. Wet floodproofing may also be used to voluntarily retrofit buildings that are older than the date of the community's first FIRM (commonly referred to as "pre-FIRM"), provided the requirement to

bring such buildings into compliance is not triggered (called "substantial improvement"). Figure 4 illustrates some suggested retrofitting of interior walls in a pre-FIRM building. However, please note that the techniques illustrated in Figure 4 cannot be used to bring a substantially damaged or substantially improved building into compliance with the NFIP. For additional information on wet floodproofing, see Technical Bulletin 7, *Wet Floodproofing Requirements.*

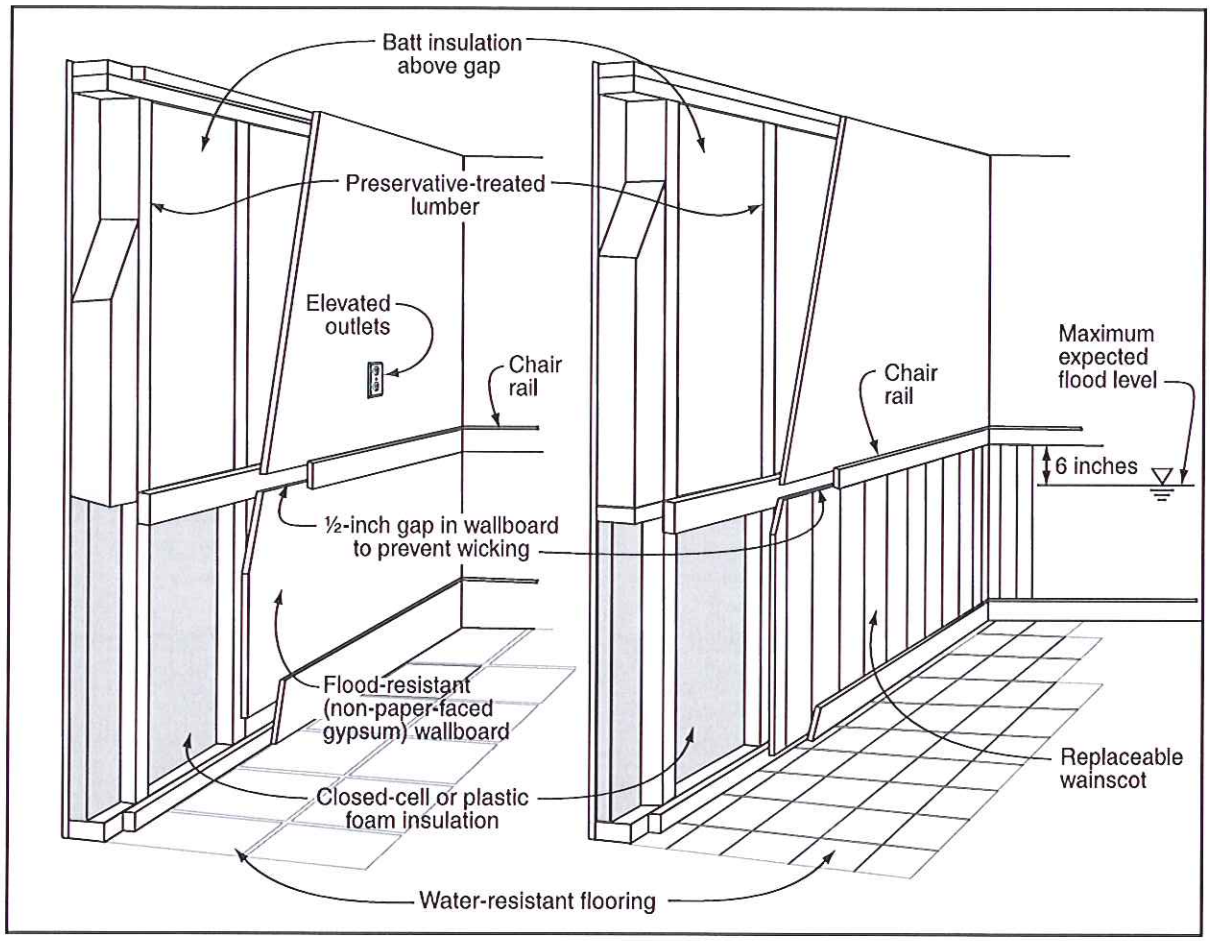


Figure 4. Partial wet floodproofing technique using flood damage-resistant materials for finished wall construction.

Buildings Outside of SFHAs

FEMA reports that up to 25 percent of NFIP flood insurance claims are paid on buildings that are outside of the mapped SFHA. This occurs for many reasons, including out-of-date maps and local drainage problems. In areas known to be prone to flooding that are not subject to the NFIP requirements, it is recommended that flood damage-resistant materials be used for construction of new buildings and for repair or renovation of existing buildings. Figure 4 illustrates some options.

The NFIP

The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as protection against flood losses, in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces adequate floodplain management regulations, FEMA will make flood insurance available within the community.

Title 44 of the U.S. Code of Federal Regulations contains the NFIP criteria for floodplain management, including design and construction standards for new and substantially improved buildings located in SFHAs identified on the NFIP's FIRMs. FEMA encourages communities to adopt floodplain management regulations that exceed the NFIP criteria. As an insurance alternative to disaster assistance, the NFIP reduces the escalating costs of repairing damage to buildings and their contents caused by floods.

NFIP Technical Bulletins

This is one of a series of Technical Bulletins that FEMA has produced to provide guidance concerning the building performance requirements of the NFIP. These requirements are contained in Title 44 of the U.S. Code of Federal Regulations at Section 60.3. The bulletins are intended for use by State and local officials responsible for interpreting and enforcing the requirements in their floodplain management regulations and building codes, and by members of the development community, such as design professionals and builders. New bulletins, as well as updates of existing bulletins, are issued periodically, as necessary. The bulletins do not create regulations; rather, they provide specific guidance for complying with the requirements of existing NFIP regulations. Users of the Technical Bulletins who need additional guidance should contact their NFIP State Coordinator or the appropriate FEMA regional office. *The User's Guide to Technical Bulletins* (http://www.fema.gov/pdf/fima/guide01.pdf) lists the bulletins issued to date.

Ordering Technical Bulletins

The quickest and easiest way to acquire copies of FEMA's Technical Bulletins is to download them from the FEMA website (http://www.fema.gov/plan/prevent/floodplain/techbul.shtm).

Technical Bulletins also may be ordered free of charge from the FEMA Publications Warehouse by calling 1-800-480-2520, or by faxing a request to 301-362-5355, Monday through Friday between 8 a.m. and 5 p.m. EST. Please provide the FEMA publication number, title, and quantity of each publication requested, along with your name, address, zip code, and daytime telephone number. Written requests may be also be submitted by mail to the following address:

FEMA Publications
P.O. Box 2012
Jessup, MD 20794

Further Information

The following publications provide further information concerning the use of flood damage-resistant materials.

Algan, H. and Wendt, R. 2005. *Pre-Standard Development for the Testing of Flood-Damage-Resistant Residential Envelope Systems, Comparison of Field and Laboratory Results - Summary Report,* Oak Ridge National Laboratory, June 2005.

American Red Cross, FEMA. 1992. *Repairing Your Flooded Home,* FEMA 232, ARC 4477.

American Society of Civil Engineers, Structural Engineering Institute. 2005. *Flood Resistant Design and Construction,* ASCE/SEI 24-05.

American Society of Civil Engineers, Structural Engineering Institute. 2005. *Minimum Design Loads for Buildings and Other Structures,* ASCE/SEI 7-05.

Brick Institute of America, n.d. *Technical Notes for Brick Construction,* Brick Institute of America, McLean, Virginia.

California Integrated Waste Management Board. 2004. "Recycled Plastic Lumber," California Integrated Waste Management Board, web page, last updated June 22, 2004 (http://www.ciwmb.ca.gov/Plastic/Recycled/Lumber).

Department of Energy. 2005. *Energy-Efficient Flood-Damage-Resistant Home Reconstruction,* (http://www.ornl.gov/sci/res_buildings/FEMA-attachments/Flood_damage-reconstruction.pdf).

FEMA. 1991. *Answers to Questions About Substantially Damaged Buildings,* FEMA 213.

FEMA. 1993. *Wet Floodproofing Requirements,* Technical Bulletin 7-93, FIA-TB-7.

FEMA. 1996. *Corrosion Protection for Metal Connectors in Coastal Areas,* Technical Bulletin 8-96, FIA-TB-8.

FEMA. 2000. *Coastal Construction Manual,* FEMA 55CD (3rd edition).

FEMA. 2005. *Home Builder's Guide to Coastal Construction: Technical Fact Sheet Series,* FEMA 499.

FEMA. 2006. *Mitigation Assessment Team Report: Hurricane Katrina in the Gulf Coast,* FEMA 549.

FEMA. 2007. *National Flood Insurance Program: Flood Insurance Manual,* Revised October 2007.

International Code Council, Inc. 2006. International Building Code®, IBC® 2006.

International Code Council, Inc. 2006. International Residential Code®, IRC® 2006.

Simpson Strong-Tie. 2008. *Technical Bulletin: Preservative-Treated Wood,* Simpson Strong-Tie T-PTWOOD08-R, July 2008 (http://www.strongtie.com/ftp/bulletins/T-PTWOOD08-R.pdf).

TPI/WTCA. 2004. TPI/WTCA *Guidelines for Use of Alternative Preservative Treatments with Metal Connector Plates,* updated June 4, 2007, (http://www.sbcindustry.com/images/PTWGuidelines.pdf).

U.S. Army Corps of Engineers. 1984. *Flood Proofing Systems and Techniques,* U.S. Army Corps of Engineers, December 1984.

U.S. Army Corps of Engineers. 1995. *Flood Proofing Regulations,* Chapters 9 and 10, U.S. Army Corps of Engineers, EP 1165-2-314.

Wood Truss Council of America (WTCA). 2005. *The Load Guide: Guide to Good Practice for Specifying and Applying Loads to Structural Building Components,* (http://www.sbcindustry.com/loads.php).

World Floor Covering Association (WFCA). n.d., Anaheim, California (http://www.wfca.org/index.html).

Glossary

Accessory structure — A structure that is on the same parcel of property as a principal structure, the use of which is incidental to the use of the principal structure.

Base flood — The flood having a 1-percent chance of being equaled or exceeded in any given year, commonly referred to as the "100-year flood." The base flood is the national standard used by the NFIP and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development.

Base flood elevation (BFE) — The height of the base (1-percent annual chance or 100-year) flood in relation to a specified datum, usually the National Geodetic Vertical Datum of 1929, or the North American Vertical Datum of 1988.

Basement — Any area of a building having its floor subgrade (below ground level) on all sides.

Enclosure or enclosed area — Areas created by a crawlspace or solid walls that fully enclose areas below the BFE.

Federal Emergency Management Agency (FEMA) — The Federal agency that, in addition to carrying out other activities, administers the National Flood Insurance Program.

Flood Insurance Rate Map (FIRM) — The official map of a community on which FEMA has delineated both the special flood hazard areas (SFHAs) and the risk premium zones applicable to the community.

Floodprone area — Any land area susceptible to being inundated by floodwater from any source.

Lowest floor — The lowest floor of the lowest enclosed area of a building, including a basement. Any NFIP-compliant unfinished or flood-resistant enclosure usable solely for parking of vehicles, building access, or storage (in an area other than a basement) is not considered a building's lowest floor, provided the enclosure does not render the structure in violation of the applicable design requirements of the NFIP.

Mitigation Directorate — The component of FEMA directly responsible for administering the flood hazard identification and floodplain management aspects of the NFIP.

Registered Design Professional — An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the State or jurisdiction in which the project is to be constructed.

Special Flood Hazard Area (SFHA) — An area delineated on a FIRM as being subject to inundation by the base flood and designated as Zone A, AE, A1-A30, AR, AO, AH, A99, V, VE, or V1-V30.

Substantial damage — Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Structures that are determined to be substantially damaged are considered to be substantial improvements, regardless of the actual repair work performed.

Substantial improvement — Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure (or smaller percentage if established by the community) before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed.

SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Conduits and fittings

B. Outlet boxes

C. Pull and junction boxes

D. Surface metal raceways

E. Wireway

1.2 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.4 RECEIVING, STORING, AND PROTECTING

A. Receive, store, and protect, and handle products according to NECA 1 – *Standard Practices for Good Workmanship in Electrical Construction*.

PART 2 - PRODUCTS

2.1 COATINGS

A. Provide products with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic that is suitable for the environment in which the product will be installed and used.

2.2 INTERMEDIATE METAL CONDUIT AND FITTINGS (IMC)

A. Furnish intermediate metal conduit (IMC) that meets the requirements of UL1242 – *Intermediate Metal Conduit*, ANSI C80.6 – *Electrical Intermediate Metal Conduit (EIMC)*.

B. Furnish zinc-plated, threaded, malleable iron fittings and conduit bodies that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*.

2.3 RIGID METAL CONDUIT AND FITTINGS (RMC)

A. Furnish rigid metal conduit (RMC) that meets the requirements of UL6 – *Rigid Metal Electrical Conduit*, NEMA C80.1 – *Electrical Rigid Steel Conduit (ERSC)*.

B. Furnish zinc-plated, threaded, malleable iron fittings and conduit bodies that meet the requirements of UL514B and ANSI/NEMA FB1.

2.4 PLASTIC-COATED STEEL CONDUIT AND FITTINGS

A. Furnish PVC exterior coated, urethane interior coated, RMC or IMC that meets the requirements of NEMA RN 1 – *PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit*.

B. Use factory-fabricated elbows.

C. Furnish 40 mil PVC exterior coated, urethane interior coated, zinc-plated, threaded, malleable iron fittings and conduit bodies meeting the requirements of UL514B – *Fittings for Conduit and Outlet Boxes* and NEMA RN 1 PVC.

2.5 RIGID NON-METALLIC CONDUIT AND FITTINGS (RNC)

A. Furnish rigid non-metallic conduit (RNC) that meets the requirements of UL651 – *Schedule 40 and 80 Rigid PVC Conduit*, NEMA TC 2 – *Electrical Plastic Tubing and Conduit*.

B. Furnish non-metallic, solvent-welded socket fittings that meet the requirements of UL514C – *Non-Metallic Fittings for Conduit and Outlet Boxes*, and NEMA TC 3 – *PVC Fittings for Use with Rigid PVC Conduit and Tubing*.

2.6 ELECTRICAL METALLIC TUBING AND FITTINGS (EMT)

A. Furnish galvanized electrical metallic tubing (EMT) that meets the requirements of UL797 – *Electrical Metallic Tubing*, NEMA C80.3 – *Steel Electrical Metallic Tubing (EMT)*.

B. Furnish compression or set-screw type fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.

2.7 FLEXIBLE METAL CONDUIT AND FITTINGS

A. Furnish galvanized steel flexible metal conduit that meets the requirements of UL1 – *Flexible Metal Electrical Conduit*.

B. Furnish zinc-plated malleable iron fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.

2.8 LIQUID-TIGHT FLEXIBLE METAL CONDUIT AND FITTINGS

A. Furnish liquid-tight flexible metal conduit that meets the requirements of UL360 – *Liquid-Tight Flexible Steel Conduit, Electrical*.

B. Furnish zinc-plated malleable iron or zinc-plated steel liquid-tight fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.

2.9 INSULATING BUSHINGS

A. Provide NRTL listed insulating bushings with 105 ºC rated insulation.

B. Manufacturer: O-Z/Gedney, Type IB.

2.10 GROUNDING BUSHINGS

A. Provide NRTL listed, galvanized malleable iron, 150ºC rated insulated throat grounding bushings with lay-in type ground cable lugs.

B. Manufacturer: O-Z/Gedney, Type BLG.

2.11 EXPANSION FITTINGS

A. Furnish NRTL listed expansion fittings with hot dipped galvanized malleable iron body, factory installed packing and a bonding jumper.

B. Manufacturer: O-Z/Gedney, Type AX, TX or EXE with Type BJ bonding jumper.

2.12 CORROSION PROTECTION TAPE

A. Furnish pressure-sensitive, 10 mil thick. PVC based tape for corrosion protection of metal conduit and fittings.

B. Manufacturer: 3M, Type 50.

2.13 RACEWAY MEASURING TAPE

A. Furnish raceway measuring tape with permanently printed measurements in one-foot increments and minimum 1200 lb average breaking strength.

B. Manufacturer: Greenlee “39243”.

2.14 SURFACE METAL RACEWAY

A. Furnish surface metal raceway that meets the requirements of UL5 – *Surface Metal Electrical Raceways and Fittings*.

B. Furnish surface metal raceway fabricated from cold rolled galvanized steel with a thickness of not less than 0.040 inches and coated with a baked enamel finish.

C. Furnish fittings required for a complete installation.

D. Manufacturer: Wiremold “500” or “700” series.

2.15 OUTLET BOXES

A. Provide outlet boxes selected for specific installations using the guidance in NEMA OS 3, *Selection and Installation Guidelines for Electrical Outlet Boxes*, and the requirements of this Section.

B. For dry locations provide galvanized steel outlet boxes that comply with UL Standard 514-A – *Metallic Outlet Boxes* and ANSI/NEMA OS1 – *Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports*.

1. For luminaire outlets use 4 inch x 1-1/2 inch deep octagonal boxes with fixture stud attachment as required to support luminaires.
2. For flush outlets in stud walls or above-grade cast-in-place concrete walls use 4 inch square x 1-1/2 inch deep boxes; provide deeper boxes or multiple gang boxes as required to fit devices. Provide raised device covers that match the thickness of the wallboard and the number of devices. Provide supplemental box supports to prevent movement of the box.
3. For flush outlets in above-grade masonry walls use masonry boxes with conduit knockouts. Provide boxes with depth suitable for the masonry unit size. Provide multiple gang boxes as required by the number of devices.
4. For surface outlet boxes in EMT raceway systems, use 4 inch x 2-1/8 inch deep square boxes. Provide deeper boxes or multiple gang boxes as required to fit devices. Provide square surface covers that match the installed device and have not less than two holes for securing the device to the cover.

C. For damp or wet locations and for surface-mounted RMC or IMC raceway systems, provide outlet boxes that comply with UL Standard 498 and 514, ANSI/NEMA FB1.

1. For lighting fixture outlets use 4 inch x 2-1/16 inch deep round cast malleable iron boxes with threaded hubs.
2. For flush or surface wall-mounted outlets, use 4-11/16 square, 2-11/16 inch deep cast malleable iron boxes with threaded hubs. Provide multiple gang boxes as required to fit devices. Provide gasketed cast malleable iron or cast copper-free aluminum covers that

match the installed device and have not less than two holes for securing the device to the cover.

2.16 PULL AND JUNCTION BOXES

A. For dry locations in clean, non-contamination environments use galvanized sheet steel pull and junction boxes that comply with UL Standard 50 Type 1 and the NEC as to size and construction. Use boxes not less than 4 inches square x 1-1/2 inches deep with screw-secured covers. Provide larger boxes as required by the number and size of conduits and conductors.

B. For dry locations in dusty or possible contamination (e.g. beryllium, explosives, or uranium) environments use galvanized steel pull and junction boxes that comply with UL Standard 50 Type 12 and the NEC as to size and construction. Use boxes not less than 6 inches square x 4 inches deep with gasketed covers. Provide larger boxes as required by the number and size of conduits and conductors.

C. For damp or wet, non-corrosive locations, in conduit runs up to 3/4 inch trade size, provide 4-11/16 inches square, 2-11/16 inches deep cast malleable iron pull and junction boxes with threaded hubs and gasketed cast malleable iron or cast copper-free aluminum covers.

D. For damp or wet, non-corrosive locations, in conduit runs 1 inch trade size and larger, provide galvanized sheet-steel pull and junction boxes and covers that comply with UL 50 Type 3R.

E. For damp or wet, non-corrosive locations that are subject to hose-directed water, provide pull and junction boxes and covers that comply with UL 50 Type 4.

F. For damp or wet, corrosive locations provide pull and junction boxes and covers that comply with UL 50 Type 4X.

G. For locations subject to occasional submersion provide pull and junction boxes and covers that comply with UL 50 Type 6.

H. Provide connection points for equipment grounding conductors in each box.

PART 3 - EXECUTION

3.1 GENERAL

A. Install complete systems of raceways and boxes for wiring systems.

B. Install raceways and boxes according to NECA 1 Standard Practices for Good Workmanship in Electrical Construction, NECA 101 Standard for Installing Steel Conduits (Rigid, IMC, EMT), NECA 111 Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC), the NEC, the manufacturer's instructions, and requirements in this Section.

C. Raceway termination points and box locations shown on the Drawings are in approximate locations unless dimensioned. Verify locations before rough-in.

D. Raceway routing is shown on the Drawings in approximate locations unless dimensioned. Coordinate routing with structure and with work of other trades. Route as required for a complete wiring system.

E. Ground and bond raceways and boxes as required in Section 260526 Grounding and Bonding for Electrical Systems.

F. Support raceways and boxes in accordance with the requirements of Section 260529 Hangers and Supports for Electrical Systems and the NEC.

G. Identify raceways and boxes as required in Section 260553, Identification for Electrical Systems.

H. Arrange raceway and boxes to maintain headroom and present neat appearance.

I. Install knockout closures in unused openings in boxes or raceways.

3.2 CONDUIT INSTALLATION

A. For low-voltage wiring systems (less than 600 volts) use conduit materials according to the NEC and the following:
   1. Outdoors - underground:
   2. Direct buried: Use RNC, plastic-coated RMC, tape-wrapped RMC, or tape-wrapped IMC. Do not use RNC where subject to physical damage. Install with 24 inches minimum cover from top of conduit to finished grade or top of paving.

      a. Concrete encased: Use RNC, plastic-coated RMC, RMC, or IMC for concrete encased underground work. Install with 24 inches minimum cover from top of encasement to finished grade or paving.

   3. Outdoors - exposed: Use RMC or IMC.
   4. Outdoor corrosive locations (including cooling towers): Use plastic-coated RMC and fittings.
   5. Outdoors - concealed: Use RMC or IMC for concealed outdoor work. Do not use bare RMC or IMC in direct contact with earth. EMT may be used for concealed outdoor work where not in contact with earth, not encased in concrete, and where not exposed to deteriorating agents.
   6. Indoors – exposed outside of designated electrical rooms or telecommunications rooms:

      a. Located less than 8 ft above the floor: Use RMC or IMC.
      b. Exposed to severe physical damage: Use RMC or IMC.
      c. Exposed to moisture: Use RMC or IMC.
      d. Exposed to corrosives: Use plastic-coated RMC and fittings.
      e. Located more than 8 ft above the floor, not exposed to deteriorating agents, and not subject to severe physical damage: Use RMC, IMC, or EMT.

   7. Indoors – concealed:

      a. Within drywall partitions and above false ceilings: Use RMC, IMC, or EMT.
      b. Within masonry or cast-in-place concrete walls or floors: Use RMC or IMC.
      c. Direct-buried under building floor slabs on grade: Use RNC, plastic-coated RMC, tape-wrapped RMC, or tape-wrapped IMC. Locate top of conduits not less than 12 inches below the bottom of the concrete slab. Install warning tape approximately 6

inches above the conduits; install multiple warning tapes above parallel conduit runs wider than 18 inches.

d. Concrete encased under building floor slabs on grade: Use RNC, plastic-coated RMC, RMC, or IMC. Locate top of concrete encasement not less than 12 inches below the bottom of the concrete slab. Install warning tape approximately 6 inches above the concrete encasement; install multiple warning tapes above concrete encasements wider than 24 inches.

8. Connection to vibrating equipment (including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment) - Use a minimum of 18 inches; maximum length as determined by the NEC:

   a. Outdoors: Use liquidtight flexible metal conduit.
   b. In mechanical rooms: Use liquidtight flexible metal conduit.
   c. Wet, damp, or corrosive indoor locations: Use liquidtight flexible metal conduit.
   d. Dry indoor locations: Use flexible metal conduit.

9. Connections to luminaires: Use 3/8 inch flexible metal conduit or metal-clad cable in 6 foot maximum lengths for tap conductors to luminaires above suspended ceilings.

B. Use 3/4-inch or larger conduit to enclose multiple conductors larger than 12 AWG.

C. For interiors of buildings, conceal conduits and boxes, unless otherwise indicated on the Drawings, within finished walls, floors and ceilings. Unless otherwise indicated on the Drawings, install concealed conduits with a minimum of bends in the shortest practical distance considering the type of building construction and obstructions. For exterior of buildings, surface mount conduit and boxes unless otherwise indicated on the Drawings.

D. Position parallel underground conduits with not less than 7-1/2 inches center-to-center separation.

E. Install expansion fittings where embedded conduits cross building expansion joints.

F. Use conduit hubs to fasten conduit to boxes in damp and wet locations.

G. Use sealing locknuts, hubs, or similar water-resistant fittings on conduits entering the top of switchgear, switchboards, motor control centers, panelboards, cabinets, pull boxes, and similar enclosures that are exposed in structures with automatic fire sprinkler systems.

H. Install insulating bushings or connectors with an insulated throat to protect conductors or cables at conduit terminations.

I. Install conduits with the following limits of bends and distance between pull points:

1. 50 ft with 3 equivalent 90 degree bends.
2. 100 ft with 2 equivalent 90 degree bends.
3. 150 ft with 1 equivalent 90 degree bend.
4. 200 ft straight run with no bends.
5. Provide large sweep radius elbows for 90 degree elbows (minimum) unless otherwise noted.

J. Stub-Up Connections:

1. Extend conduits through concrete floor for connection to freestanding equipment with an adjustable top or coupling threaded inside for plugs, and set flush with the finished floor or equipment pad.
2. Extend conductors to equipment with rigid steel conduit; flexible metal conduit may be used 6 inches above the floor.
3. Where equipment connections are not made under this Subcontract, install threaded insert plugs set flush with the floor.

K. Install conduit sealing fittings according to the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with NRTL-listed conduit sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points and elsewhere as indicated:

1. Where conduits enter or leave NEC Class I hazardous locations.
2. Where conduits pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air-conditioned spaces.
3. Where conduits go between areas where air pressure differential must be maintained.
4. Where conduits enter an enclosure protected by a clean agent total flooding fire suppression system.
5. Where otherwise required by the NEC.

L. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduits dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

M. Install plastic-coated RMC and fittings according to the NEC and manufacturer's instructions. Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

N. Do not use RNC 90 degree elbows larger than 2 inch trade size; use plastic-coated RMC, tape-wrapped RMC, or tape-wrapped IMC for 2-1/2 inch trade size and larger 90 degree elbows.

O. Maintain the following minimum clearances between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C):

1. 6” at perpendicular crossings.
2. 12” between parallel runs.

P. Avoid moisture traps in conduit system; provide junction boxes with drain fitting at low points in conduit system.

Q. Install corrosion protection tape on metal conduits and fittings in contact with soil using half-lapped wrappings.

R. Install grounding bushings at the following locations:

1. At every entry to enclosures on metallic conduits containing circuits rated 100 amperes and higher.
2. On metallic conduits entering enclosures through concentric, eccentric or oversize knockouts.
3. On metallic conduits that terminate to a metallic enclosure without effective electrical connection such as locknuts or threaded bushings.

S. Install conduit measuring tape in empty raceways. Leave not less than 12 inches of slack at each end of the tape. Secure each end of tape.

T. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.

1. Run parallel or banked raceways together on common supports.
2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

U. Join raceways with fittings designed and approved for that purpose and make joints tight.

1. Use insulating bushings to protect conductors.

V. Tighten set screws of threadless fittings with suitable tools.

W. Terminations:

1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

X. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

Y. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 OUTLET BOX INSTALLATION

A. Install outlet boxes with centers at the following heights unless noted otherwise on the Drawings:

1. Receptacle, telephone and data outlets:

a. Common Areas (such as conference and break rooms): 18 inches above finished floor.
b. Offices and Workstations: 18 inches above finished floor.

2. Receptacle, telephone and data outlets at lab benches and counters -- center 44 inches maximum above finished floor; coordinate locations to be above, or completely within, bench and counter backsplashes.
3. Light switches: center 48 inches above finished floor and within 6 inches of door frame.

4. Thermostats: center 48 inches above finished floor.
5. Wall mounted emergency lights: 80 inches above finished floor or 12 inches below the ceiling; whichever is lower.

B. Coordinate outlet box locations with modular furniture and associated hangers.

C. Where the Drawings show outlets as adjacent, align outlet boxes with each other and group them symmetrically.

D. Orient boxes to accommodate wiring devices oriented as specified in Section 262726 Wiring Devices.

E. Install a multi-gang box where more than one device is mounted together. Do not use sectional type boxes.

F. Install box with plaster ring for single or multiple device outlets.

G. Use flush mounted outlet boxes in finished areas.

1. Install flush outlet boxes and fittings in walls and ceilings so that front edge is flush with the finished surface. Repair broken wall or ceiling surfaces so no gaps or open spaces exceed 1/8 inch at the edge of boxes or fittings.
2. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
3. Do not install flush mounting boxes back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
4. Secure flush mounting boxes to interior wall and partition studs. Accurately position to allow for surface finish thickness.
5. Install stamped steel bridges to fasten multiple flush mounting outlet boxes between studs.
6. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

H. Install adjustable steel channel fasteners for hung ceiling outlet box.

I. Do not fasten boxes to ceiling support wires or other piping systems.

J. Support boxes independently of conduit.

K. Install partitions in boxes as follows:

1. Between 277 volt devices.
2. Between 277 volt light switches devices and 120 volt devices.
3. Between either 120 volt or 277 volt devices and low voltage control switches.

L. Install a blank cover plate on each outlet box in which no device is installed.

3.4 PULL AND JUNCTION BOX INSTALLATION

A. Install pull and junction boxes as shown on the Drawings and as required for splices, taps, wire pulling, and compliance with regulatory requirements.

B. Install indoor pull and junction boxes in accessible locations above accessible ceilings and in unfinished spaces. Position boxes so covers can be removed. Place boxes to maintain headroom.

C. Install a concrete collar around handholes not placed in sidewalks or pavement.

3.5 WIREWAY INSTALLATION

A. Install wireways at locations indicated on the Drawings.

B. Mount plumb and level.

3.6 SURFACE METAL RACEWAY INSTALLATION

A. Install surface metal raceway at locations indicated on the Drawings.

B. Use flat-head screws, clips, and straps to fasten raceway channel to surfaces.

C. Mount plumb and level.

3.7 ADJUSTING

A. Adjust flush-mounted outlets to make front flush with finished floor, wall, or ceiling material.

B. Install knockout closures in unused openings in boxes.

3.8 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

C. Repair damage to paint or PVC finishes with matching touch-up coating recommended by the manufacturer.

3.9 FIELD QUALITY CONTROL

A. Provide final protection and maintain conditions to ensure that coatings and finishes are without damage or deterioration at final inspection.

3.10 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."

E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

F. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

G. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Change from ENT to RNC, Type EPC-40-PVC, rigid steel conduit, or IMC before rising above the floor.

H. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

I. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack at each end of pull wire.

J. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

K. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30 deg F, and that has straight-run length that exceeds 25 feet.

1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:

   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
   c. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 deg F temperature change.
   d. Attics: 135 deg F temperature change.

2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change.
3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

L. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

3.11 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
    b. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits, placing them 24 inches o.c. Align planks along the width and along the centerline of conduit.

END OF SECTION 26 05 33

Coquina Beach
Concessions Building Remodeling
Manatee County, Florida

CONTRACTOR'S REQUEST FOR SUBSTITUTION

PROJECT: Coquina Beach Concessions Remodel DATE: 4-14-11

SPECIFICATION SECTION: 09 6700 ITEM(S): Part 2 - Products.

SPECIFIED MANUFACTURER: Tnemec Company, Inc.

SPECIFIED MODEL NO: "Series 222 Deco-Pread"

PROPOSED MANUFACTURER: Plexi-Chemie Inc.

PROPOSED MODEL NO: "PlexiQuartz Decorative Flooring System"

REASON/S FOR alternate

REQUEST FOR fit, form, function alternate

SUBSTITUTION PlexiQuartz

Attach complete technical data, including laboratory tests, if applicable, in duplicate.

A. Will approval affect dimensions shown on Drawings in any way? No ✓ Yes
Explain (Attach drawings if necessary):

B. Will the Contractor pay for any changes to the building design, including engineering and detailing costs caused by the approval? No ✓ Yes
Explain: N/A.

C. Will approval affect the work of other trades? No ✓ Yes
Explain:

D. Manufacturer's guarantees of the proposed and specified items are: Same ✓ Different
Explain:

E. Does the proposed item meet all applicable Codes, Ordinances and regulations for this specific application? No Yes ✓
Explain:

F. Has proposed item been used locally in similar applications? No ____ Yes ✓
Explain: Jenny Park, Ft. Meyers - Flagler County Civic Arena, Bunnell, Drew Park Concession, Jax, Alberta Field Concession, Jax, FL.

G. If approved, will the Owner receive a credit for the proposed alternate material? No ✓ Yes ____
Explain: N/A.

H. Does the proposed alternate material meet the same applicable standards (ASTM, ANSI, UL, FS.) as the specified item? No ____ Yes ✓
Explain: ____

It is the Contractor's responsibility to provide all information necessary to determine the proposed alternate material is equal or better than the specified item. This includes any test reports, product data, manufacturer's specifications, color samples, product samples or the like as may be required for an evaluation.

The Architect and Owner will not be required to prove any product is not equal or suitable to the Project.

SUBMITTED BY: Joanne Grant
Firm: Industrial Flooring Specialists
Address: 6016 Le Lane Ave North
Jacksonville, FL 32254
Signature: Joanne Grant Date: 4-14-11

FOR ARCHITECT'S USE:
Not Acceptable X
No Exceptions Taken ____
By: ____ Date: 04.14.2011

END OF SECTION 01 60 10

MANDATORY SITE VISIT ATTENDANCE RECORD

04-04-11 A09:01 OUT

Title: Remodel Coquina Beach Concessions Bldg.

Location: Coquina Beach Concession Building, 2650 Gulf Drive South, Bradenton Beach, Florida 34217

IFB #: 11-1021-DS

SITE VISIT: **April 4, 2011 @ 9:00 AM.**

NAME/PRINT	SIGNATURE	FIRM
Donna M. Stevens Construction Buyer	Donna M Stevens	Manatee County Government
Darin Cushing Project Manger Property Management		Manatee County Government
~~Tom Yarger~~ ~~Construction Services~~ ~~Project Mgr.~~ ~~Property Management~~		~~Manatee County Government~~
Drazen Ahmedic, AIA Engineer of Record		Manatee County Government
BILL JOHN > SANDHOFF DAVID		SANDHOFFMAIL@AOL.COM SANDHOFF CONSTRUCTION CO. INC. 941-737-8442
Justin McNesky		JMcNesky@halfacreco.com Halfacre Construction P-941-907-9099
Jim Straw		JIM.STRAW@MANSONROOFING.COM MANSON ROOFING 941-748-5547
PHIL GOLDMAN		PJ. GOLDMAN PAINTING (941) 722-8484 PJGOLDMAN@YAHOO.COM

NAME/PRINT	SIGNATURE	FIRM
Brett Allred	Brett Allred	Commercial Air & Refrig 941-737-0330 Brett@CommercialAirService.com
Todd Radebach	Todd Radebach	Remco Builders Inc 941-748-5200 TRadebach@remcoBuilders.com
CHRIS ARNOLD	C Arnold	C ARNOLD 4423 @ VERIZON.NET 941-773-9728
Brian Hawley	Brian Hawley	TRI-TECH CONST TRI 751-1727 (F) 751-3568 BRIANANDTERRI8@AOL.COM
Aaron Nidoskay	EO KOCH Construction	EO KOCH construction 863 385 8649 KOCHCON@Strato.NET
Jim Romisa	SSA	
Mike Wheland	Mike Wheland	Parks & Recreation EXT. 6005 Mike.Wheland@MyMonaTeeDog

MANDATORY SITE VISIT ATTENDANCE RECORD

Title: Remodel Coquina Beach Concessions Blvd

Location: Coquina Beach Concession Building, 2650 Gulf Drive South, Bradenton Beach, Florida 34217

IFB #: 11-1021-DS

SITE VISIT: April 12, 2011 @ 9:00 AM.

NAME/PRINT	SIGNATURE	FIRM
Darin Cushing Project Manger Property Management	D. D. C	**Manatee County Government**
Will Carlton Pat Carlton Const, Inc		Pat Carlton Const, Inc