2012 IBC Flood Design

Outline

- The National Flood Insurance Program (NFIP)
- The Building Code & ASCE
- A-Zone Design Requirements
- V-Zone Design Requirements

Floodplain Basics

Types of Floodplains:

- Riverine
Types of Floodplains:

- Coastal

Types of Flood zones:

- A - Areas subject to inundation by the 1-percent-annual-chance flood event
- V - Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves

Occurrence Probability:

<table>
<thead>
<tr>
<th>Event</th>
<th>10 year Event</th>
<th>25 year Event</th>
<th>50 year Event</th>
<th>100 year Event</th>
<th>250 year Event</th>
<th>500 year Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>The table below provides the probability of events occurring at least once in specific time periods. The probabilities range from 5% to 99.9%.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Floodplain management is the operation of a community program of corrective and preventative measures for reducing flood damage.

Floodplain management generally includes developing and enforcing requirements for zoning, subdivisions and buildings, and special-purpose ordinances.

Flood Maps

- FEMA flood maps are available at no cost online
- Not every area has been mapped or updated
Flood Insurance Rate Maps

Elevation Certificate Forms

- FEMA has expanded its form to require more data
- Form uses 1988 NAVD or 1929 NGVD

Flood Insurance Rate Maps

Elevation Certificate

Authority Having Jurisdiction

NFIP (floodplain) requirements are enforced by the Floodplain Manager

NFIP (building) requirements have been moved into the Building Code
Authority Having Jurisdiction
Building Official (Post - 2012)

NFIP building requirements are now included in the building codes and are enforced by the Building Official.

Outline

- The National Flood Insurance Program (NFIP)
- The Building Code & ASCE
- A-Zone Design Requirements
- V-Zone Design Requirements

Definitions

BASE FLOOD ELEVATION (BFE)

The elevation of the base flood, including wave height, relative to the National Geodetic Vertical Datum (NVGD), North American Vertical Datum (NAVD) or other datum specified on the Florida Insurance Rate Map (FIRM).
**Definitions**

**DESIGN FLOOD ELEVATION (DFE)**

The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard map.

In areas designated as Zone AO, the design flood elevation shall be the elevation of the highest existing grade of the building’s perimeter plus the depth number (in feet) specified on the flood hazard map.

**Definitions**

**DRY FLOODPROOFING**

A combination of design modifications that results in a building or structure, including the attendant utility and sanitary facilities, being water tight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist loads as identified in ASCE 7.

**Definitions**

**FLOOD DAMAGE-RESISTANT MATERIALS**

Any construction material capable of withstanding direct and prolonged contact with floodwaters without sustaining any damage that requires more than cosmetic repair.
**Information on construction Documents**

Construction documents shall be dimensioned and drawn upon suitable material.

Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and shown in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

**Construction Documents**

Construction documents shall show the size, section and relative locations of structural members with floor levels, column centers and offsets dimensioned. The design loads and other information pertinent to the structural design shall be indicated on the construction documents.

**Flood Hazard Documentation**

The following documentation shall be prepared and sealed by a registered design professional and shall be submitted to the building official:

- Non V Zone
- V Zone

These provisions are in addition to those found in Chapters 1 and Section 1602
**Minimum Plan Requirements**

**V Zone**

For breakaway walls designed to resist a nominal load of less than 10 psf (0.48 kN/m²) or more than 20 psf (0.96 kN/m²), construction documents shall include a statement that the breakaway wall is designed in accordance with ASCE 24.

**V Zone**

The elevation of the bottom of the lowest horizontal structural member

Designed that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist floatation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously.

**Non V Zone**

The elevation of the lowest floor

For fully enclosed areas below the design flood elevation ... the design will provide for equalization of hydrostatic flood forces

For dry flood proofed nonresidential buildings ... flood proofing is designed in accordance with ASCE 24.
**Performance Requirements**

**Flood Design Data**

For buildings located in whole or in part in flood hazard areas ... the following information, referenced to the datum on the community’s Flood Insurance Rate Map (FIRM), shall be shown...

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**Performance Requirements**

**Flood Design Data**

In flood hazard areas not subject to high-velocity wave action, the elevation of the proposed lowest floor, including the basement...

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**Performance Requirements**

**Flood Design Data**

In flood hazard areas not subject to high-velocity wave action, the elevation to which any nonresidential building will be dry flood proofed.
Performance Requirements

Flood Design Data
In flood hazard areas subject to high-velocity wave action, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including the basement.

NFIP 50% Rule

General
Within flood hazard areas all new construction of buildings, structures and portions of buildings and structures, including substantial improvement and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads.

Design Requirements

Design and Construction
The design and construction of buildings and structures located in flood hazard areas, including flood hazard areas subject to high-velocity wave action, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.
DEBRIS IMPACT LOADS
loads on a structure caused by flood-borne debris striking the structure, or a portion thereof, often sudden in nature and large in magnitude.
**FLOOD-DAMAGE-RESISTANT MATERIAL**

Any construction material capable of withstanding direct and prolonged contact with floodwaters, without sustaining any damage that requires more than cosmetic repair.

**PROLONGED CONTACT WITH FLOODWATERS**

Partial or total inundation by floodwaters for

1. 72 hours for non-coastal flood hazard areas; and
2. 12 hours for Coastal High Hazard Areas and Coastal A Zones.

**LOWEST FLOOR**

Lowest floor of the lowest enclosed area, including basement; however, an unfinished or flood-resistant enclosure used solely for parking, building access, or storage shall not be considered the lowest floor provided such enclosure is built as specified in this standard.
A – Zones are those areas subject to inundation by the 1-percent-annual-chance flood event.
A - Zone Requirements

Elevation

- Structures shall have the lowest floor (including basements) elevated to or above the Design Flood Elevation (DFE) in conformance with the requirements of Table 2-1.

<table>
<thead>
<tr>
<th>Structure Category</th>
<th>Minimum Elevation of Lowest Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>DFE</td>
</tr>
<tr>
<td>II</td>
<td>BFE + 1 ft or DFE, whichever is higher</td>
</tr>
<tr>
<td>III</td>
<td>BFE + 1 ft or DFE, whichever is higher</td>
</tr>
<tr>
<td>IV</td>
<td>BFE + 2 ft or DFE, whichever is higher</td>
</tr>
</tbody>
</table>

A - Zone Requirements

Structure Category
### A - Zone Requirements

#### Use of Fill
- **Fill shall not be constructed or placed in floodway areas unless it is demonstrated that the fill will not, during the design flood,**
  1. increase the flood level, and
  2. reduce the conveyance of the flood.

#### Slabs-on-Grade and Footings
- **Use of slabs-on-grade is acceptable if the slab is installed on structural fill that is placed in conformance with Section 2.4 or is installed on undisturbed soil of adequate bearing capacity.**

#### Slabs-on-Grade and Footings
- **The top of the slab shall be at or above the DFE as specified in Table 2-1.**
- **If turned down to act as footings, the bottom of the turned-down edges of the slab shall be installed at or below the depth of expected scour.**
Enclosures Below the DFE

- Required Openings in Foundation Walls
  - Foundation walls that enclose an area below the DFE shall contain openings to allow for automatic entry and exit of floodwaters during design flood conditions.
  - Openings in coastal breakaway walls are not required

Enclosures That Require Openings

- Solid perimeter foundation walls (crawlspace or under-floor spaces)
- Solid perimeter foundation walls (below-grade crawlspace)
- Solid perimeter foundation walls (with full-height under-floor spaces)
- Garages attached to elevated buildings

Enclosures That Require Openings

- Enclosed areas under buildings elevated on open foundations in A zones
- Solid perimeter foundation walls on which manufactured homes are installed
- Accessory structures (detached garages and storage sheds)
A - Zone
Flood Resistant Materials

New construction and substantial improvements in flood hazard areas shall be constructed with flood damage-resistant materials below the elevations specified in Table 5-1.

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Flood Resistant Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 5-1: Minimum Elevations, Relative to Base Flood Elevation (BFE), below which Flood Damage-Resistant Materials Shall Be Used</td>
<td></td>
</tr>
<tr>
<td>Flood Hazard Area</td>
<td>Elevation - FFE</td>
</tr>
<tr>
<td>A - Zone</td>
<td>Flood Resistant Materials</td>
</tr>
<tr>
<td>Category</td>
<td>I</td>
</tr>
<tr>
<td>A</td>
<td>FFE</td>
</tr>
<tr>
<td>B</td>
<td>BFE</td>
</tr>
<tr>
<td>C</td>
<td>Elevation - BFE</td>
</tr>
<tr>
<td>D</td>
<td>Elevation - HFE</td>
</tr>
</tbody>
</table>

Table 5-1: Class Descriptions of Materials

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Highly resistant to flood damage, including damage caused by standing water.</td>
</tr>
<tr>
<td>2</td>
<td>Resistant to flood damage due to flooding, and to flood damage due to ice jams.</td>
</tr>
<tr>
<td>3</td>
<td>Resistant to flood damage due to flowing, and to flood damage due to ice jams.</td>
</tr>
<tr>
<td>4</td>
<td>Resistant to flood damage due to flowing, and to flood damage due to ice jams.</td>
</tr>
<tr>
<td>5</td>
<td>Resistant to flood damage due to flowing, and to flood damage due to ice jams.</td>
</tr>
</tbody>
</table>

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A - Zone
Flood Resistant Materials

<table>
<thead>
<tr>
<th>Type of Building Material</th>
<th>Flammability</th>
<th>Acceptable</th>
<th>Commercial Availability</th>
<th>Durability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Concrete, non-polyurethane</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Polyurethane</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Wood, no polyurethane</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Polyurethane, non-foam</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

A - Zone
Foundation Types

- **A Zone** – At-grade foundation atop structural fill
- **A Zone** – Crawlspace w/ Flood Vents
- **Coastal A Zone** – Piles or deep footing embedded below anticipated scour w/ Flood Vents

Design Considerations

Hydrostatic - Buoyant Force
Creates high pressures against the submerged bottom of a building
Design Considerations
Hydrostatic - Buoyant Force

Hydrostatic – Lateral Forces
Creates high pressures against the submerged sides of a building

Design Considerations
Hydrostatic - Lateral Force
Debris Impact
loads are those that result from debris, ice, and any object transported by floodwaters striking against buildings and structures, or parts thereof.

Design Considerations

Debris Impact

Outline

- The National Flood Insurance Program (NFIP)
- The Building Code & ASCE
- A-Zone Design Requirements
- V-Zone Design Requirements
V – Zone areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves.

V – Zone:

- V– Zone: Wave height 3.0 – 1.5 feet deep
- V– Zone: Wave height 1.0 – 1.5 feet
- V– Zone: Wave height < 1.0 feet
- Limit of base surge and waves
- Limit of tsunami and waves
V - Zone

Requirements

- The bottom of the lowest horizontal structural member of the lowest floor shall be at or above the Design Flood Elevation (DFE), in conformance with the requirements of Table 4-I.
V - Zone 
Requirements

Elevation

TABLE 4-1. Minimum Elevation of Bottom of Lowest Supporting Horizontal Structural Member at Lowest Floor Relative to Base Flood Elevation (BFE) or Design Flood Elevation (DFE)—Coastal High Hazard Areas and Coastal A Zones

<table>
<thead>
<tr>
<th>Structure Category</th>
<th>Parallel</th>
<th>Perpendicular</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>BFE</td>
<td>BFE</td>
</tr>
<tr>
<td>II</td>
<td>DFE</td>
<td>DFE + 1 ft or DFE, whichever is higher</td>
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<td>IV</td>
<td>BFE + 1 ft or DFE, whichever is higher</td>
<td>BFE + 2 ft or DFE, whichever is higher</td>
</tr>
</tbody>
</table>

Use of Fill

- Fill material used for structural support shall not be permitted in Coastal High Hazard Areas and Coastal A Zones.
- Placement of nonstructural fill for minimal site grading and landscaping and drainage shall be permitted
V - Zone Requirements

Foundations

- Foundations constructed in erodible soils shall be founded on piles.
- Piles that are jetted or installed in an augured excavation shall be seated by driving.

Embedded Piles

- In erodible soils, pile tip penetration shall be to a minimum depth of 10 ft below mean water level (-10 ft MWL), unless the design demonstrates that pile penetration to a shallower depth will provide the support and stability required.

V - Zone Requirements

Foundations

- The design shall consider that local scour and liquefaction of the erodible soil during design flood conditions will render as non-supportive, the soil at least to a depth of two times the pile diameter after flood- or storm-induced erosion has been considered.
A - Zone

Flood Resistant Materials

Any construction material capable of withstanding direct and prolonged contact with floodwaters, without sustaining any damage that requires more than cosmetic repair

Same as A - Zone

V - Zone

Design Considerations

Interior Finished Floor
Slab on Grade
Piles
Breakaway Walls

V - Zone

Design Considerations

Wind Load

No less than 10 psf
No more than 20 psf

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V - Zone Design Considerations

Moderate Wave Action

- Floodwaters Flow Through
- Breakaway Walls Release

Design Considerations

Design Wave Action

- Slab on Grade Releases
- Floodwaters Flow Through
V - Zone Design Considerations

Severe Wave Action

- Floodwaters Flow Through
- Buoyant Forces

Combined Forces

- Wind Forces
- Lateral Forces
- Buoyant Forces
Design Considerations

V - Zone

- Hydrostatic – Buoyant Forces
- Hydrostatic - Lateral Forces
- Debris Impact
- Hydrodynamic Forces

Same as A - Zone

Design Considerations

Flood - Hydrodynamic

Imparts tremendous lateral loads against submerged building structure

Design Considerations

Hydrodynamic Forces
Design Considerations
Hydrodynamic Forces

Requirements
- Waves breaking against the side or underside of the structure;
- Drag, inertia, and other wave-induced forces acting on structural members supporting elevated structures;

Design Considerations
Hydrodynamic Forces

Requirements
- Uplift forces from breaking waves striking the undersides of structures;
- Wave runup forces including those deflected by the structure; and
- Erosion and Scour

Questions?
Paperless Plans Submittal, Review and Construction

Outline

- Electronic Documents Submittals
- Digital and Electronic Signatures
- Electronic Plan Review
- Electronic Field Inspection

Transition Plan

- The transition will not be easy,
- It will not be quick,
- And it will not be cheap
- But it is necessary

Because the E-business model for building department operations will improve productivity for everyone.
TRANSITION PLAN
Decision Checklist

a) What file format will be mandated?
   Limit choices to common formats

b) How will documents be exchanged?
   Establish an online document exchange if possible

c) Where will documents be stored?
   Within permit software, network server or cloud server

d) How will files be named?
   See naming protocol

e) How will documents be reviewed?
   Blue Beam, Adobe Acrobat Pro, Project Docs, etc.

f) How will signatures be verified?
   Public key match by the department or a third party

g) What hardware will be required?
   Dual monitors for plans examiners

h) What software will be required?
   PDF management for plans examiners

i) How will documents be marked?
   PDF management stamp template
The transition begins with understanding the different types of electronic documents. Documents fall into one of three categories:
1. Secure Signature Required
2. Notarized Signature Required
3. No Signature Required
Secure Signature Required - Drawings, calculations, and specifications documents, in electronic format, prepared by Florida licensed architects and/or engineers are required to be signed and sealed with an encrypted electronic signature. The encrypted signature must be verified by a third party or public/private key match feature of the PDF management software used by the building department.

Notarized Signature Required - Application forms, and any other document required to be notarized must be received as a scanned copy of the paper document that has been signed and notarized.

Print and execute the document. Scan the completed document to a PDF file.

Applicant should keep the original paper documents on file.

No Signature Required - Cut sheets, product approval documents, shop drawings, pictures and other supporting information should be submitted in PDF format for consistency. If multiple formats are authorized, be sure that everyone that is required to participate in processing the documents has the software required to handle the documents.
Documents not prepared by an architect or engineer should contain an information block that identifies who created the document, and contact information if there are questions about the document.

The contractor should assemble the following documents for submittal:
- Permit application
- Drawings
- Support Documents

A paper application can be downloaded from the building department’s website, completed, signatures notarized, and scanned into an electronic file as a PDF file type.
An online fillable permit application can be completed online, printed, signed, notarized and scanned into an electronic file as a PDF file type.

An online permit application process may also allow the information to be completed and submitted; however a printed form that has been appropriately signed and notarized must also be submitted as a scanned PDF.

Drawing documents may be created by the contractor, or come from one or more sources; however, all of the drawings required to describe the proposed work must be batched into one package for submittal with the permit application.
DRAWINGS

- Make sure that drawings prepared by an architect or engineer are properly signed with a digital signature. Handle these files with care. Any alteration of the electronic document made after the document was electronically signed will void the signature.

DRAWINGS

- Drawing packages should be saved as multi-page PDF files
- Each design professional must have a separate file
- When future re-works or revisions are necessary, the entire drawing package for the effected design professional must be re-submitted, even though a revision may only affect one page

SUPPORT DOCUMENTS

- Support documents including specifications, calculations, photographs, forms, and other documents must be converted to an electronic PDF format and organized in folders with file names that clearly describe what the document is.
FORMATTING

Documents must be in a file format that can be opened and processed by the department.

Only accept documents that are in a common format that do not require expensive software to manage, such as Microsoft Office, PDF, or JPEG file formats.

REFERENCES

ELECTRONIC SIGNATURES
DIGITAL SIGNATURES
SECONDARY CERTIFICATIONS
DOCUMENT SECURITY & SIGNATURE VERIFICATION

REFERENCE MATERIALS

ELECTRONIC SIGNATURE AND SEAL BY STATE
www.BrackenEngineering.com
Seals and signatures are used by state of Florida licensed Architects and Engineers to authenticate documents.

A digital signature serves the same purpose as wet seals and embossed seals.

An electronic or digital signature is an approved method of authenticating a document as long as it complies with applicable rules.

Currently, Florida Statute 668 requires that an electronic signature be:

- Unique to the signee,
- Under the control of the signee,
- Created using an “asymmetric cryptosystem”,
- And is recognizable through the use of a process called “Key pair” technology.

As mentioned earlier, when the requirements of FS 668 are met, both the signer and the recipient can be assured of the authenticity and integrity of the electronic signature.

An electronic signature is password protected and cannot be copied or used by anyone except the signer.
An important feature of an electronic signature is that it can be verified as authentic only when it is attached to an electronic file in a PDF format.

Construction drawings or documents for use in permitting a project bearing an electronic signature may only be submitted to a jurisdiction in an electronic format.

The visible element of an electronic signature on a printed copy of an electronic document cannot be verified as authentic, and is not valid as a permit submittal.

Electronic documents bearing an electronic signature may be printed for use in the field only after the jurisdiction has electronically stamped and secured the document.
SIGNATURE VERIFICATION

- **a) Third Party Verification** - This process is a premium service purchased by the user.
  - When the plans examiner opens the electronic document, the PDF management software will access the third party verification database via the internet and authenticate the signature.
  - If the document has been modified since it was electronically signed, the verification process will invalidate the signature file.

SIGNATURE VERIFICATION

- **b) Public Key Verification** - This process requires the design professional to provide the building department with the public key file to use when verifying his/her electronic signature.
  - The building department would need to maintain a design professional database (Certificate store) that identifies the contact and licensure information for each design professional.

SIGNATURE VERIFICATION

- The PDF management software, such as Adobe Pro, BlueBeam, ProjectDox, etc., will compare the design professional’s public and private keys to verify the authenticity of an electronic signature.
  - Each jurisdiction will need to determine how they will verify encrypted signatures used by Florida Architects and Engineers.
SIGNATURE VERIFICATION

- Since signature verification relies on a comparison between the signature file embedded in the electronic document (private key) and the user's master identifier (public key), the jurisdiction has a choice of two options, or could use both options.

DOCUMENT SECURITY SETTINGS

- Electronic documents created by a design professional will by necessity pass through the contractor, and perhaps the owner, before being delivered to the building department.
- The documents will need to be saved, marked by the building department and possibly printed by the contractor.

DOCUMENT SECURITY SETTINGS

- When a PDF file is created there is an opportunity to set the rights others will have when handling it.
- Document security settings must allow files to be copied, saved, and printed.
- It is not necessary to lock the documents that have a digital signature so that the information cannot be altered because the digital signature component will notify the reviewer when the document has been altered.
A digital signature does not lock the document however, it will be necessary for the building department to establish the security settings policy it needs to be able to verify that the document is authentic, mark the drawings as the official documents, and return the job copy to the contractor for use on the job.

To create a digital signature, open the "Tools" panel and select "Visual Signature".

Click "OK" at the first screen.
CREATING A SIGNATURE

- Click “OK” to create a signature field.

- After the signature field is created, the signature file can be selected, or a new signature can be created.
- Note that you only have to create your signature once.
- Select “New Digital ID” to create your signature.

- Fill in all of the open fields and click “Finish”.

BOAF / AIA-FLORIDA / FES JOINT TASK FORCE
To create a password protected Digital ID select "New PKCS#12 digital ID File" and click Next.

The file name will pre-load.
Create a password and confirm.
Click "Finish".

Now your digital ID has been created and can be used to certify the document.
The top line is your signature file name; it will auto-load.
CREATING A SIGNATURE

- On the second line fill in your password
- The third line is the name of the visible signature, it will auto-load
- The fourth line will auto load the signature info

CREATING A SIGNATURE

- Open the drop-down list and select choose new Appearance

CREATING A SIGNATURE

- Name the signature
- Edit the fields as needed
- Import an image
CREATING A SIGNATURE

Before the signature is added the file must be saved.

VISIBLE SIGNATURE IMAGES

A visible signature image is not required in the validation process. However, a visible signature image created by the signature software is helpful to notify the reviewer that the document is digitally signed.

A proper visible image can include an image of the signee’s seal, the name of the signee, date, contact information, and the phrase “Digitally signed by...”
IMPLEMENTATION STRATEGY

- Transitioning the permit process from paper to electronic requires developing a strategy specifically tailored to your department.
- The strategy will have to address multiple issues that may need to be addressed differently in your jurisdiction than in other jurisdictions.

WORK FLOW - The transition will result in fewer customers in your office. The role of the permit technician will change from customer service (front line) to data processing (back office).
- The electronic plan review process will allow multiple reviews to take place at the same time.
IMPLEMENTATION STRATEGY

- Work flow - Other departments or agencies that have review/approval responsibility may have access to the plans as soon as they are notified that they have been submitted.
- Diagram your workflow process before and after the transition to identify changes that staff will need to understand.

Integration of systems - Permitting software, inspection request systems, network servers, internet capabilities, e-mail capabilities, handheld devices, etc.
- Make sure your technology support specialists are included in the design of the process as well as the installation requirements.

Integration of systems - System changes always have associated costs for software and programming services that must be anticipated in the transition plan implementation strategy.
IMPLEMENTATION STRATEGY

- **Graduated implementation by permit type** -
  Start with the easy permit types that do not require lots of documents or drawings to avoid being overwhelmed while staff is learning the process.
  Progress gradually until the new work process is capable of accepting any project type or size.

- **Training** - Everyone will need to be trained on the new workflow. This includes elected officials, administrators, customers, and staff.

- **Publicize the change** - Produce printed guidance that will help your customers understand their role in the new process. Issue press releases highlighting the broad benefits of a streamlined electronic process.
  **Monitoring and evaluation** - Create benchmarks that can help everyone recognize how the transition is progressing.
IMPLEMENTATION STRATEGY

- **Establish a timeline** - Create a schedule or timeline that considers the acquisition and installation of software and hardware, integration of various components, training.
- **Control the urge to expand the scope of the project** - Scope creep will cause problems with both the budget and the schedule. Plan for a second phase of the project to tweak the process after the initial phase is complete.

EQUIPMENT

- Dual monitors are essential when reviewing electronic plans. One monitor used to navigate a plan should be at least 24 inches measured diagonally.
- 30 or 40 inch monitors are recommended to allow more of the document to be visible.
- The second monitor can be used to access the permit software, internet, codes and references, and checklists.

EQUIPMENT

- High definition monitors or televisions are lower in resolution and can create eye strain during long term use.
- It is recommended that high resolution computer monitors be used to reduce this effect.
The software used to navigate the documents should have measurement and notation tools that allow the plans examiner to scale the drawings and make notations.

Adobe Acrobat Professional, BlueBeam or ProjectDocs are examples of PDF management programs that will adequately handle the plan review task.

The most commonly used PDF reader is Adobe Acrobat. With their free PDF reader it is possible to view file content, see the document history and validate digital signatures.

When a drawing file is opened with Adobe Acrobat, the program will indicate if it has been digitally signed by showing the signature panel button in the right side of the tray above the drawing.
PLANS REVIEW
Validating A Signature

- Click on the Signature Panel button to open the signature panel
- The name of the signee will be shown

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PLANS REVIEW
Validating A Signature

- From the Signature Properties panel click on the Show Certificate button

BOAF / AIA-FLORIDA / FES JOINT TASK FORCE

PLANS REVIEW
Exporting A Public Key

- The signee must send the public key to the Authority Having Jurisdiction
- This is done by exporting the public key
- The Authority Having Jurisdiction must receive the public key and save it in the adobe trusted certificate folder

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- Click on the Export the encrypted data line and then the next button

- Fill in the information and click the next button

- Skip the sign the file option and click next
PLANS REVIEW
Exporting A Public Key

- Address the file to the Authority Having Jurisdiction and click next

PLANS REVIEW
Trusting A Certificate

- Select the Trust tab and check all of the trust settings
- Click on the trust button

- Check the content boxes
- Click on the Ok button
PLANS REVIEW
Viewing Signature Details

- Open the Details tab to view information about the signature.

- Move the slide down to view more information.

- The public key can be seen by highlighting the Public Key line.
PLANS REVIEW
File Structure

- An orderly submittal of drawing files will assist the building department in determining the folders that contain drawing files from the folders that contain support information files.
- The folder structure is applicable when submitting files on a portable storage device or uploading them directly via the internet or FTP site.

PLANS REVIEW
File Structure

- Master Folder (Project Name)
  - Sub-Folder ( Permit Application)
  - Sub-Folder ( Plan Drawings)
  - Sub-Folder ( Structural Calculations)
  - Sub-Folder ( Energy Calculations)
  - Sub-Folder ( Product Approvals)
  - Sub-Folder ( Specification Cut-sheets)

- Sub-Folder (Plan Drawings)
  - Sub-sub-folder - Civil/Site
  - Sub-sub-folder - Architectural
  - Sub-sub-folder - Structural
  - Sub-sub-folder - Plumbing
  - Sub-sub-folder - Mechanical
  - Sub-sub-folder - Electrical
  - Sub-sub-folder - Fire Sprinkler
  - Sub-sub-folder - Fire Alarm

PLANS REVIEW
File Naming Protocol

- File Naming refers to the name given to each individual electronic file which contains one or more drawings.
- Individual plan pages created by a design professional should be saved as one multi-page PDF.
PLANS REVIEW
File Naming Protocol

- CAD drawings shall be saved into a PDF file formatted in single layer Black and White (Monochrome) setting
- At a minimum, a file name should intuitively indicate the file contents
- Abbreviations may be used to classify and group related drawings

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PLANS REVIEW

- A plans examiner’s workflow is usually driven by a report or queue process within the permit software that lists the permits that need a review
- In a paper process, the physical location of the plan set is notated in the permit software

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PLANS REVIEW

- In an electronic document process, the documents may be accessed through a tab that links to the electronic documents, or a notation that identifies where to find the documents on the network server
- Understand that any notation or comment placed on a drawing that has been signed with an encrypted signature will void the signature, requiring a replacement page to be submitted

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The best way to preserve the integrity of the original document is to open each document, and save it with a unique file name (for instance add “review” to the file name).

When drawings need to be re-worked to achieve code compliance, a marked up drawing and/or narrative can be transmitted to the contractor for correction and re-submittal.

When reviewing and making comments two methods exist:
- Annotate the PDF file using PDF “Tools” and then perform a “Save-As”
- Use standardized forms that can be PDF’ed and returned electronically to the contractor or design professional.

When a rework drawing is received and approved it should replace the defective drawing in the official “approved” drawing set. The obsolete drawing(s) should be placed in a sub-folder labeled “Obsolete.”
Electronic Field Inspection

- **EQUIPMENT**

- **MARKING JOB SITE DOCUMENTS**

  - Filed tablets prove essential when reviewing electronic plans in the field.
  - With wireless capabilities, the results of the inspection can be uploaded to the server in real-time.

- **EQUIPMENT**

  - The software used to navigate the documents should have measurement and notation tools that allow the field inspector to scale the drawings and make notations.
MARKING JOBSITE DOCUMENTS

- Each jurisdiction will need to create an approval stamp image to watermark approved documents, for use in the jobsite.
- In a paper process an ink impression stamp is normally used to identify official documents that are returned to the contractor to be used on the jobsite.

MARKING JOBSITE DOCUMENTS

- In an electronic process, marked electronic documents are returned to the contractor via the internet or storage device.
- The contractor can then have a jobsite paper set of documents printed for use by the building inspector(s) if necessary.
- When the building inspectors have the ability to access official documents via the internet a printed set of documents may not be needed.

Questions?

Thank You