**Worksheet # 1 - Determining the Local Design Flood Elevation – Part I (Riverine)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Site Name:** |  | | **Date:** | |  |
| **Address:** |  | | | | |
| **Latitude (y):** |  | **Longitude (x):** | |  | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | State Flood Study1 | | FEMA Effective FIRM2 | | FEMA Best Available3 Preliminary, Draft, or Advisory Flood Hazard Data  **(Circle Source)** | |
| Data Available (Yes/No) |  | |  | |  | |
| Panel Number & Date |  | |  | |  | |
| Flood Zone Designation | N/A | |  | |  | |
| Floodway (Yes/No) |  | |  | |  | |
| Design1 or Base Flood Elevation2, 3 |  | |  | |  | |
| Vertical Datum^ |  | | NAVD 88 | |  | |
| ^4Resulting Elevations below must be in same datum, if conversion factor needed, note here: NAVD88 = NGVD29 - \_\_\_\_\_\_ ft. | | | | |  | |
| **Riverine Req.** | +2 | | +3 |  | +3 |  |
| Resulting Elevation | Box A  NGVD29 NAVD88 | | Box B  NGVD29 NAVD88 | | Box C  NAVD88D | |
| If none of the above data is available and/or the project is in a watershed 50 acres or greater in size, licensed NJ Professional Engineers may use NJFHACA Method 5 or 6 to approximate the DFE for design purposes, however, an unexpired Flood Hazard Verification Letter dated July 17th, 2023 and later, which includes a Flood Hazard Design Elevation is necessary to ensure compliance with State standards. Enter elevation in Box D. | | | | | | |
| Date of Letter Verifying the NJ Flood Hazard Design Flood Elevation (FHDFE): | | Box D | | | | |
| ***Select highest elevation from Box A, B, C, and D to determine the***  ***New Jersey Flood Hazard Design Flood Elevation (FHDFE) and input into Box E*** | | | | | | |

1Use Appendix 2 of the FHACA Rules (N.J.A.C. 7:13) to identify state-studied waters; or visit https://www.nj.gov/dep/floodcontrol/studied\_streams.htm

2<https://msc.fema.gov/portal/home>

3 The most recent available preliminary flood risk guidance FEMA has provided.  The Best Available Flood Hazard Data may be depicted on but not limited to Advisory Flood Hazard Area Maps, Work Maps or Preliminary FIS and FIRM.

4Vertical datum conversion factor sources: FIS report or [https://vdatum.noaa.gov/runapp\_agreement.php](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fvdatum.noaa.gov%2Frunapp_agreement.php&data=02%7C01%7Cagetz%40mbakerintl.com%7C9da4370732444a13c06c08d7c458740c%7C4e1ee3db4df64142b7b9bec15f171ca4%7C0%7C0%7C637193756500551738&sdata=3pGAVARwzUgDAjulwkS0TYEmEm0DlVBp6sYJ3iRSJHg%3D&reserved=0)

**This worksheet is designed to result in accurate determinations of the Federal Flood Risk Management Standard (FFRMS). Please consult *the New Jersey Guidebook for Implementing the Federal Flood Risk Management Standard* for additional information to ensure that all applicable federal projects receive full reimbursement.**

|  |
| --- |
| Comments: |

**Worksheet # 1 - Determining the Local Design Flood Elevation – Part II (Riverine)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Site Name:** |  | | | | | |
| **Freeboard Requirements** | | |  | **Highest Elevation** |  | **Highest Elevation with Freeboard Comparison** |
| **State Freeboard Requirements -** The NJ Flood Hazard Area Control Act (NJFHACA) requires that a minimum of 1 foot of freeboard be added to the Flood Hazard Design Flood Elevation (FHDFE) and no lower than that required by the UCC pursuant to the calculation below for Class I through IV facilities. | | 1 Foot | + | **Box E**  \_\_\_\_ Ft | = | **State**  **Box 1**  \_\_\_\_\_ Ft |
| **Local Community Freeboard Requirements** – More restrictive freeboard must be added if a higher freeboard is adopted in the Community’s Flood Damage Prevention Ordinance. | | \_\_\_ Ft\*\*\* | + | **Box E**  \_\_\_\_ Ft\* | = | **Local**  **Box 2**  \_\_\_\_\_\_\_ Ft |
| **ASCE Class IV**: 500-year Elevation  **Or**  **FFRMS Critical Action:** 500-year Elevation | |  | | | | Box 3 |
| **FFRMS Critical Action** or **ASCE 24\*\* Type of Facility (circle one):**  Class I Class II Class III Class IV | | If Class IV **or** FFRMS Critical Action, chose the Highest Elevation from Box 1, Box 2 and Box 3 à | | | | **FFRMS Critical Action or ASCE 24 Critical Facility**  **Box 4**  \_\_\_\_\_\_\_ Ft |
| ***Select highest DFE from State (Box 1), Local (Box 2),***  ***and ASCE (Box 4):***  ***(This is your Local DFE\*\*\*\*) à*** | | | | | | **Box 5**  \_\_\_\_\_\_\_ Ft |
| ***Note Vertical Datum à*** | | | | | |  |
| ***Note Flood Zone à*** | | | | | |  |

\*Review community ordinance to determine if the freeboard should be added to the BFE or NJ State Flood Hazard Area DFE.

\*\*ASCE Classes and Elevation Requirements are Defined in ASCE 24-14: <https://www.fema.gov/sites/default/files/2020-07/asce24-14_highlights_jan2015.pdf>

\*\*\* The local Flood Damage Prevention ordinance may require that additional freeboard for a critical facility be added to the Local Minimum Freeboard calculated in Box 2 which may be higher than the State minimum freeboard calculated in Box 1. The local ordinance should be consulted to confirm the calculations in this worksheet. In no circumstance should a critical facility be constructed lower than required by both the Flood Hazard Area Control Act and the Uniform Construction Code.

\*\*\*\*Local Design Flood Elevation (DFE) Definition - the Local DFE is the elevation reflective of the most recent available preliminary flood elevation guidance FEMA has provided as depicted on but not limited to Advisory Flood Hazard Area Maps, Work Maps, or Preliminary FIS and FIRM which is also inclusive of freeboard specified by the New Jersey Flood Hazard Area Control Act and Uniform Construction Codes and any additional freeboard specified in a community’s ordinance. In no circumstances shall a project’s LDFE be lower than a permit-specified Flood Hazard Area Design Flood Elevation or a valid NJDEP Flood Hazard Area Verification Letter plus the freeboard as required in ASCE 24 and the effective FEMA Base Flood Elevation.

|  |
| --- |
| **COMMENTS:** Use the box on the first page to document the use of additional worksheets, comments, assumptions, and sources. For example, source of the datum conversion factor or effective date of the local ordinance requirements in Box 2.  **ATTACH WORKSHEETS 2C (Federal Flood Risk Management Standard Documentation) to this worksheet if applicable.** |

**Worksheet # 2A - Determining the Local Design Flood Elevation – Part I (Coastal)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Site Name:** |  | | **Date:** | |  |
| **Address:** |  | | | | |
| **Latitude (y):** |  | **Longitude (x):** | |  | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | FEMA Effective FIRM2 | | FEMA Best Available3 Preliminary, Draft, or Advisory Flood Hazard Data  **(Circle Source)** | |
| Data Available (Yes/No) |  | |  | |
| Panel Number & Date |  | |  | |
| Flood Zone Designation |  | |  | |
| LiMWA Area (Yes/No) |  | |  | |
| Base Flood Elevation2, 3 |  | |  | |
| Vertical Datum^ |  | |  | |
| ^4Resulting Elevations below must be in same datum, if conversion factor needed, note here: Box A NAVD88 = NGVD29 - \_\_\_\_\_\_ ft. | | | |  |
| Resulting Elevation | Box B  NGVD29 NAVD88 | | Box C  NAVD88 | |
| If none of the above data is available a licensed NJ Professional Engineer may use NJFHACA Method 6 to approximate the DFE for design purposes, however, an unexpired Flood Hazard Verification Letter dated July 17th, 2023 and later, which includes a Flood Hazard Design Elevation is necessary to ensure compliance with State standards. Enter elevation in Box D. | | | | |
| Date of Letter Verifying the NJ Flood Hazard Design Flood Elevation (FHDFE): | | Box D | | |
| ***Select highest elevation from Box B, C, and D to determine the***  ***New Jersey Flood Hazard Design Flood Elevation (FHDFE) and input into Box E*** | | | | |

2<https://msc.fema.gov/portal/home>

3 The most recent available preliminary flood risk guidance FEMA has provided.  The Best Available Flood Hazard Data may be depicted on but not limited to Advisory Flood Hazard Area Maps, Work Maps or Preliminary FIS and FIRM.

4Vertical datum conversion factor sources: FIS report or [https://vdatum.noaa.gov/runapp\_agreement.php](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fvdatum.noaa.gov%2Frunapp_agreement.php&data=02%7C01%7Cagetz%40mbakerintl.com%7C9da4370732444a13c06c08d7c458740c%7C4e1ee3db4df64142b7b9bec15f171ca4%7C0%7C0%7C637193756500551738&sdata=3pGAVARwzUgDAjulwkS0TYEmEm0DlVBp6sYJ3iRSJHg%3D&reserved=0)

**This worksheet is designed to result in accurate determinations of the Federal Flood Risk Management Standard (FFRMS). For Coastal/tidal critical and non-critical actions, Box 3A must be completed to ensure an accurate comparison of local and State freeboard requirements. Please consult *the New Jersey Guidebook for Implementing the Federal Flood Risk Management Standard* for additional information to ensure that all applicable federal projects receive full reimbursement.**

|  |
| --- |
| Comments: |

**Worksheet # 2A - Determining the Local Design Flood Elevation – Part II (Coastal)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Site Name:** |  | | | | | |
| **Freeboard Requirements** | | |  | **Highest Elevation** |  | **Highest Elevation with Freeboard Comparison** |
| **State Freeboard Requirements -** The NJ Flood Hazard Area Control Act (NJFHACA) requires that a minimum of 1 foot of freeboard be added to the Flood Hazard Design Flood Elevation FHDFE and no lower than that required by the UCC pursuant to the calculation below for Class I through IV facilities. | | 1 Foot | + | **Box E**  \_\_\_\_ Ft | = | **State**  **Box 1**  \_\_\_\_\_ Ft |
| **Local Community Freeboard Requirements** – More restrictive freeboard must be added if a higher freeboard is adopted in the Community’s Flood Damage Prevention Ordinance. | | \_\_\_ Ft | + | **Box E**  \_\_\_\_ Ft\* | = | **Local**  **Box 2**  \_\_\_\_\_\_\_ Ft |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Coastal Area Federal Flood Risk Management Standard for Non-Critical Actions** – complete only if applicable (See WORKSHEET 2C guidance) | | 2 Feet | + | **Box E**  \_\_\_\_\_ Ft |  | **Coastal FFRMS Non-Critical Action**  **Box 3A**  \_\_\_\_\_\_ Ft |
| **Coastal Area Federal Flood Risk Management Standard for Critical Actions** – complete only if applicable (See WORKSHEET 2C guidance) | | 3 Feet | + | **Box E**  \_\_\_\_\_ Ft |  | **Coastal FFRMS Critical Action**  **Box 3A**  \_\_\_\_\_\_ Ft |
| **Coastal Area Federal Flood Risk Management Standard for Non-Critical Actions:**  Please Select the **Lower** of Elevation values when compared between Box 3A and Box G. | |  | | | | **Box 3B**  \_\_\_\_\_\_ Ft |
| **Coastal Area Federal Flood Risk Management Standard for Critical Actions:**  Please Select the **Higher** of Elevation values when compared between Box 3A and Box G. | |  | | | | **Box 3B**  \_\_\_\_\_\_ Ft |
| **ASCE 24\*\* Type of Facility (circle one):**  Class I Class II Class III Class IV  *If Class I or II no further entry is required*  *If Class III or IV, enter elevations below* | | If Class III or Class IV, chose Highest Elevation from below and enter here à | | | | **ASCE 24 Critical Facility**  **Box 4**  \_\_\_\_\_\_\_ Ft |
| Class III choose either:  Box 1 Elevation + 1’  Box 2 Elevation + 1’\*\*\* |  |  | | | | |
| Class IV choose either:  Box 1 Elevation + 1’  Box 2 Elevation + 1’\*\*\* | Box F |  | | | | |
| Class IV and Coastal Area Federal Flood Risk Management Standard for Critical and Non-Critical Actions: 500-year Wave Adjusted Elevation Must be Determined Using Worksheet 2B | Box G |  | | | | |
| ***Select highest DFE from State (Box 1), Local (Box 2), Coastal Area FFRMS (Box 3B – if applicable) and ASCE (Box 4 – if applicable):***  ***(This is your Local DFE\*\*\*\*) à*** | | | | | | **Box 5**  \_\_\_\_\_\_\_ Ft |
| ***Note Vertical Datum à*** | | | | | |  |
| ***Note Flood Zone and if LiMWA Area à*** | | | | | |  |

\*Review community ordinance to determine if the freeboard should be added to the BFE or NJ State Flood Hazard Area DFE.

\*\*ASCE Classes and Elevation Requirements are Defined in ASCE 24-14: <https://www.fema.gov/sites/default/files/2020-07/asce24-14_highlights_jan2015.pdf>

\*\*\* The local Flood Damage Prevention ordinance may require that additional freeboard for a critical facility be added to the Local Minimum Freeboard calculated in Box 2 which may be higher than the State minimum freeboard calculated in Box 1. The local ordinance should be consulted to confirm the calculations in this worksheet. In no circumstance should a critical facility be constructed lower than required by both the Flood Hazard Area Control Act and the Uniform Construction Code.

\*\*\*\*Local Design Flood Elevation Definition - the Local DFE is the elevation reflective of the most recent available preliminary flood elevation guidance FEMA has provided as depicted on but not limited to Advisory Flood Hazard Area Maps, Work Maps, or Preliminary FIS and FIRM which is also inclusive of freeboard specified by the New Jersey Flood Hazard Area Control Act and Uniform Construction Codes and any additional freeboard specified in a community’s ordinance. In no circumstances shall a project’s LDFE be lower than a permit-specified Flood Hazard Area Design Flood Elevation or a valid NJDEP Flood Hazard Area Verification Letter plus the freeboard as required in ASCE 24 and the effective FEMA Base Flood Elevation.

|  |
| --- |
| **COMMENTS:** Use the box on the first page to document the use of additional worksheets, comments, assumptions, and sources. For example, source of the datum conversion factor or effective date of the local ordinance requirements in Box 2.  **ATTACH WORKSHEETS 2B (Wave Height Adjustment including any attachments signed and sealed by a Licensed NJ Professional Engineer) and 2C (Federal Flood Risk Management Standard Documentation) to this worksheet if applicable.** |

## Worksheet # 2B – Determining the Wave Height Adjusted 500 Year Preliminary and Effective Map Elevation for ASCE24-14 Critical Facilities and Critical Actions under 44 CFR Part 9

The effective FIRMs and FIS reports for a community typically have information regarding the 500-year floodplain. In New Jersey’s coastal areas, neither the effective nor the preliminary 500-year floodplain map elevations include wave height in the specified elevation. These must be included using either the empirical methodology included in Part I of this worksheet or be calculated using the process and resources discussed in Part II.

**Part I – Worksheet for Determining the Best Available 500-year Elevation including a Wave Height Adjustment Using Empirical Methodology**

Diagram

Description automatically generated

Empirical Formula:

500 Year Elevation With Wave Height =

500 Year FIS Study Elevation +

[.55 \* (500 Year FIS Study Elevation - Ground Surface Elevation)]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wave Height Calculation Table for Critical Facilities in Coastal Zones** | | | | | |
| Effective FIRM | | | Preliminary FIRM | | |
| 500 Year Elevation | Box 1A  NGVD29 NAVD88 | FT | 500 Year Elevation | Box 2A  NAVD88 | FT |
| Ground Elevation | Box 1B  NGVD29 NAVD88 | FT | Ground Elevation | Box 2B  NAVD88 | FT |
| Wave Height  (.55\*(Box 1A-Box 1B) | Box 1C | FT | Wave Height  (.55\*(Box 2A-Box 2B) | Box 2C | FT |
| 500 Year Elevation w/ Wave Height  (Box 1A + Box 1C) | Box 1D  NGVD29 NAVD88 | FT | 500 Year Elevation w/ Wave Height  (Box 2A + Box 2C) | Box 2D  NAVD88 | FT |
| Vertical Datum - Resulting Elevations below must be in same datum, if conversion factor needed, note here:  NAVD88 = NGVD29 - \_\_\_\_\_ft. | Box 1E  NAVD88 | FT |  |  | Ft |
| ***Select highest Elevation from Effective (Box 1D or 1E)***  ***and Preliminary (Box 2D)***  ***Alll Elevations must be in NAVD88***  ***This is your Class IV 500-Year Elevation à***  ***ENTER RESULT IN WORKSHEET 2A, BOX G*** | | | | Box 3A | FT  NAVD88 |

**Part II. Determining Wave Height Adjustment Using Detailed Analyses**

The empirical formula given in Part I, above, is a conservative estimate of the wave height adjustment to the preliminary and effective 500 year elevations in New Jersey’s coastal areas. If there are structures or protective works between a project and shoreline where waves break, additional analyses may be performed to further refine the wave runup using the following guidance documents: In areas where there are bulkheads, other houses, and structures between the water body and the proposed critical facility that can reduce wave height, there are more specific methodologies that could be used to analyze overland waves to determine the 500-year elevation including the wave height adjustment with more accuracy.

Determination of Wave Characteristics <https://www.fema.gov/sites/default/files/documents/fema_determination-wave-characteristics-guidance_112021.pdf>

Coastal Wave Runup and Overtopping <https://www.fema.gov/sites/default/files/documents/fema_coastal-wave-runup-overtopping_112021.pdf>

Coastal Wave Setup <https://www.fema.gov/sites/default/files/2020-03/frm_p1wave1.pdf>Overland

Wave Propagation <https://www.fema.gov/sites/default/files/documents/fema-coastal-overland-wave-propagation_112021.pdf>

These analyses should be performed by a licensed NJ Professional Engineer familiar with coastal erosion processes and the impact of wave loads on structures. It is recommended that the project designers contact the funding agency, the NFIP Coordinator’s Office, and the local Floodplain Administrator if these methodologies for determining wave height adjustments are pursued.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wave Height Calculation Table for Critical Facilities in Coastal Zones** | | | | | |
| Effective FIRM | | | Preliminary FIRM | | |
| 500 Year Elevation w/ Wave Height | Box 4A | FT | 500 Year Elevation w/ Wave Height | Box 5A | FT |
| Vertical Datum - Resulting Elevations below must be in same datum, if conversion factor needed, note here:  NAVD88 = NGVD29 - \_\_\_\_\_ft. | Box 4B | FT |  |  |  |
| ***Select highest Elevation from Effective (Box 4A or 4B)***  ***and Preliminary (Box 5A) - ALL ELEVATIONS MUST BE IN NAVD88***  ***This is your 500-Year Elevation à***  ***ENTER RESULT IN WORKSHEET 2A: LOCAL DESIGN FLOOD ELEVATION, BOX G*** | | | | Box 6A | FT  NAVD88 |
| ***ATTACH DOCUMENTATION OF ALL ANALYSES INCLUDING THE SIGNATURE AND SEAL OF A LICENSED NJ PROFESSIONAL ENGINEER TO THIS WORKSHEET*** | | | | | |

## Worksheet # 2C - Federal Flood Risk Management Standard Documentation Worksheet

## Note: This worksheet is intended to be used with the following resources:

* New Jersey Guidebook for Implementing the Federal Flood Risk Management Standard
* WORKSHEET 1 and 2A: Local Design Flood Elevation (LDFE) Worksheet which determines the most restrictive Best Available Flood Hazard Data for either Coastal or Riverine.
* WORKSHEET 2B: Determining the Wave Height Adjusted 500 Year Preliminary and Effective Map Elevation for ASCE 24-14 Critical Facilities and Critical Actions under 44 CFR Part 9 (For Coastal)
* 44 CFR 9.4 FEMA Critical Action Definition and 44 CFR 9.11 Mitigation for guidance on critical action elevation standards
* June 3, 2022 FEMA Policy 104-22-0003 Partial Implementation of the Federal Flood Risk Management Standard for Hazard Mitigation Assistance Programs (Interim) <https://www.fema.gov/sites/default/files/documents/fema_fp-104-22-0003-partial-implemetnation-ffrms-pa-interim.pdf>  
  American Society for Civil Engineers (ASCE) Standard: ASCE 24-14 Flood Resistant Design and Construction
* The Flood Hazard Area Control Act and local Flood Damage Prevention Ordinance Regulations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **FFRMS Worksheet Summary** | | | | | |
| Type of Action | Y/N | Federal Flood Risk Standard (FFRMS) | | | |
| **Non-critical Action1** |  | **Project Design Flood Elevation (from Applicable FFRMS Worksheet and Worksheet 1/2A, Box 5)** | \_\_\_\_\_\_\_\_\_\_\_ FT | | |
| **Critical Action2** |  | **Vertical Datum Confirmation:**  **(Circle one)** | NGVD or NAVD88 | | |
| **Floodplain Type:**  **(Check one)** | | **Flood Zone**  **Designation** | \_\_\_\_\_\_\_\_\_\_\_ | | |
| Riverine |  | **LiMWA (Coastal A) or V Zone Construction (Check one)** | | Yes | No |
| Coastal |  |  |  |
| 1If yes, Use the FFRMS Non-Critical Action Worksheet  2If yes, Use the FFRMS Critical Action Worksheet | | | | | |

|  |  |  |
| --- | --- | --- |
| **Project Name:** | | |
| **FFRMS Critical Action Worksheet**  **Complete only the Riverine or the Coastal Box on this Worksheet.** | | |
| **Building Class** | **RIVERINE** | **COASTAL** |
| **FFRMS Standard with State and Local Compliance** | |
| Class I  Class II  Class III  Class IV | 1. Complete Worksheet 1 2. Enter the Elevation from Box 5, below   \_\_\_\_\_\_\_\_\_\_ FT NAVD88 | 1. Complete Worksheet 2B. 2. Complete Worksheet 2A including Boxes 4, F, and G. 3. Enter the Elevation from Box 5, below   \_\_\_\_\_\_\_\_\_\_ FT NAVD88 |
| WORKSHEET 1 & 2A: Local Design Flood Elevation (LDFE) Worksheet which determines the most restrictive Best Available Flood Hazard Data – Box 5 must include vertical datum conversions to NAVD88 if necessary  WORKSHEET 2B: Determining the Wave Height Adjusted 500-Year Preliminary and Effective | | |
|  | | |

|  |  |  |
| --- | --- | --- |
| **FFRMS Non-Critical Action Worksheet**  **Complete only one of the six boxes on this Worksheet.** | | |
| **Building Class** | **RIVERINE** | **COASTAL** |
| **FFRMS Standard with State and Local Floodplain Compliance** | |
| Class  1 & 2 | 1. Complete Worksheet 1 including Box 3B 2. Enter the Elevation from Box 5, below | 1. Complete Worksheet 2A including Boxes 3A and 3B 2. Enter the Elevation from Box 5, below   \_\_\_\_\_\_\_\_\_ FT NAVD88 |
| Class 3 | 1. Complete Worksheet 1 including Boxes 3, 4, and E. 2. Enter the Elevation from Box 5, below | 1. Complete Worksheet 2B. 2. Complete Worksheet 2A including Boxes 3A, 3B, 4, F, and G. 3. Enter the Elevation from Box 5, below   \_\_\_\_\_\_\_\_\_ FT NAVD88 |
| Class 4 | 1. Complete Worksheet 1 including Boxes F and G 2. Enter the Elevation from Box 5, below   \_\_\_\_\_\_FT NAVD88 | 1. Complete Worksheet 2B. 2. Complete Worksheet 2A including Boxes 3A, 3B, 4, F, and G. 3. Enter the Elevation from Box 5, below   \_\_\_\_\_\_\_\_\_\_ FT NAVD88 |
| WORKSHEET 1 and 2A: Local Design Flood Elevation (LDFE) Worksheet which determines the most restrictive Best Available Flood Hazard Data – Box 5 must include vertical datum conversions in necessary.  WORKSHEET 2B: Determining the Wave Height Adjusted 500 Year Preliminary and Effective | | |

APPENDIX D

**PART IV – FLOOD INFORMATION – Site Specifications**

|  |
| --- |
| **PART IV – FLOOD INFORMATION - To Be Completed by the Floodplain Administrator** |

Non-residential building: Section D-1

Building in a non-coastal A-Zone^: Section D-2

Building in a V Zone or Coastal A Zone^: Section D-3

Multi-family or mixed-use building: Section D-4

Agricultural structure: Section D-5

Accessory structure: Section D-6

Elevator proposed: Section D-7

Below-grade parking proposed: Section D-8

^Non-coastal A Zone is defined as riverine areas or tidal areas landward of the Limit of Moderate Wave Action (LiMWA). Coastal A Zone is defined as tidal areas seaward of the Limit of Moderate Wave Action (LiMWA).

**D-1**

|  |  |  |
| --- | --- | --- |
| *SITE SPECIFICATIONS – NON-RESIDENTIAL BUILDINGS ONLY* | | |
| Lowest Electrical/Mechanical Equipment | Description: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Dry Floodproofing Certificate for areas below the Base Flood Elevation plus a minimum of 1-foot Freeboard | Y / N | |
| Flood Resistant Materials | Y / N | |

**D-2**

|  |  |
| --- | --- |
| *SITE SPECIFICATIONS – A ZONE BUILDINGS^* | |
| ***Note: Incl. accessory structures, detached garages, and storage sheds.  Subgrade crawlspaces and basements are prohibited.*** | |
| Top of Lowest Floor Elevation | \_\_\_\_\_\_\_\_\_\_ |
| *Openings in Walls and Foundations (see* ***FEMA Technical Bulletin 1****\*):* | |
| * Number of openings in walls and foundations | \_\_\_\_\_\_\_\_\_\_ |
| * Square inches of all openings | \_\_\_\_\_\_\_\_\_\_ |
| * Engineered openings | Y / N |
| * Engineered opening manufacturer and model | \_\_\_\_\_\_\_\_\_\_ |
| * Architect/Engineer Certification of Non-Engineered opening | Y / N |
| Anchoring (manufactured homes, accessory buildings, storage sheds, recreational vehicles on-site greater than 180 days) | Y / N |
| Architect/Engineered Certification for Back-filled Stem Walls | Y / N |

\*<https://www.fema.gov/nfip-technical-bulletins>

^Non-coastal A Zone is defined as riverine areas or tidal areas landward of the Limit of Moderate Wave Action (LiMWA). Coastal A Zone is defined as tidal areas seaward of the Limit of Moderate Wave Action (LiMWA).

**D-3**

|  |  |
| --- | --- |
| *SITE SPECIFICATIONS**–**V ZONE AND COASTAL A ZONE^ BUILDINGS* | |
| Lowest Horizontal Member Elevation | \_\_\_\_\_\_\_\_ |
| Size of Enclosure (must be less than 300 square feet external dimension for lower insurance rates) | \_\_\_\_\_\_\_\_ |
| Use of Enclosure | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Number of openings in breakaway walls | \_\_\_\_\_\_\_\_ |
| Coastal A Zone Breakaway Wall Certification | Y / N |
| Non-Conversion Agreement Attached | Y / N |
| * Deed Restricted | Y / N |
| *Free of Obstruction (see* ***FEMA Technical Bulletin 5\*****):*   * Access Ramps/Stairs/Decks are open to water flow | Y / N |
| * Access Ramps / Stairs / Decks are structurally supported and independent of the Structure | Y / N |
| * Engineer’s Certificate for Breakaway Walls, Engineered Walls, Slabs, or Other Potential Obstructions where Piles and Columns are not feasible | Y / N |

\*<https://www.fema.gov/nfip-technical-bulletins>

^Non-coastal A Zone is defined as riverine areas or tidal areas landward of the Limit of Moderate Wave Action (LiMWA). Coastal A Zone is defined as tidal areas seaward of the Limit of Moderate Wave Action (LiMWA).

**D-4**

|  |  |
| --- | --- |
| *SITE SPECIFICATIONS – MULTI-FAMILY AND MIXED-USE BUILDINGS* | |
| **See: *FEMA Flood Mitigation Measures for Multi-Family Buildings^ & NFIP Technical Bulletin 3 - Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings\****  ***Notes: Basements and below grade parking area prohibited below residential portions of multi-family structures including those for hotels and motels. Dry floodproofing is prohibited in non-residential portions of mixed-use structures in Coastal A and V Zones. Dry floodproofing is prohibited for all areas servicing residential areas and ancillary portions of residential structures which service residential areas. At least one access to residential areas must be available for use and cannot be dry floodproofed. Building systems servicing residential portions of structures cannot be located in dry-floodproofed areas and must be elevated above the LDFE.***    ***ASCE 24-14 limits dry floodproofing:***   1. ***To areas where the base flood velocities do not exceed 5 feet/second; and***   ***2) Any proposed human intervention is in conformance with ASCE 24-14 6.2.3*** |  |
| Below grade basements and parking do not service any residential portions of the structure? | Y / N |
| Below grade basements and parking are not located in a Coastal A Zone or V Zone based upon an evaluation of the most recent best available flood hazard data? | Y / N |
| No residential areas including at least one building egress are dry floodproofed and all residential areas including those meeting the definition of ancillary space are above the BFE? | Y / N |
| All residential areas including those meeting the definition of ancillary space are above the BFE? | Y / N |
| Mechanical, Electrical, and Plumbing Systems are located at or above the LDFE or if below the LDFE are designed to resist flood loads and prevent water from entering or accumulating within the components and service only non-residential portions of the structure and meets the requirements of chapter 7, ASCE 24-14? | Y / N |
| Substantial Improvement and Substantial Damage measures meet standards and practices discussed in the *FEMA Mitigation Measures for Multi-Family Buildings*^? | Y / N |
| A *Floodproofing Certificate* for non-residential portions of the structure has been submitted at permit application? | Y / N |
| An *Emergency Operations Plan* for floodproofing in non-residential portions of the structure has been submitted at permit application and meets ASCE 24-14 6.2.3?  ***Note: This shall include meeting the 12-hour flood warning time unless the community operates a flood warning system. If so, the designer will have to determine the available time necessary to implement dry floodproofing measures.*** | Y / N |
| All proposed floodproofing products used in non-residential areas meet *American National Standard for Flood Mitigation Equipment* (ANSI/FM)? | Y / N |
| *Inspection and Maintenance Plan* proposed at permit application?  ***Note: Inspections are recommended at least once a year and could be coordinated with regular drills.*** | Y / N |
| The architect/engineer has provided evidence that the structure can withstand a combination of flood loads (hydrostatic, hydrodynamic, wave, and impact) according to ASCE 7? | Y / N |
| The *Floodproofing Certificate* has been fully completed at project completion? | Y / N |

^<https://content.govdelivery.com/attachments/USDHSFEMA/2020/06/24/file_attachments/1481529/16-J-0218_Multi-FamilyGuidance_06222020.pdf>

\*<https://www.fema.gov/nfip-technical-bulletins>

**D-5**

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| *SITE SPECIFICATIONS – AGRICULTURAL STRUCTURES* | |
| ***FEMA Floodplain Management Bulletin P-2140 Floodplain Management Requirements for Agricultural Structures and Accessory Structures*\***  ***Note: Variances can only be granted in municipalities that have adopted the New Jersey Model Code Coordinated Ordinance after January 2021.*** |  |
| Meets the FEMA or Model Code Coordinated Ordinance definition of Agricultural Structure and is used exclusively for that use? | Y / N |
| If Substantial Improvement / Substantial Damage is determined, is elevation required? | Y / N |
| If Substantial Improvement / Substantial Damage is determined and the structure type requires dry-floodproofing, is the floodproofing proposed to the LDFE?  ***Note: Structure cannot be located in a V Zone or Coastal A Zone.*** | Y / N |
| Variance requested to repair/restore to pre-flood condition and wet floodproof? | Y / N |
| If a variance is requested, is justification provided with an explanation of the hardship? | Y / N |
| Is a variance granted that restricts use? | Y / N |
| Is the structure anchored? Is mechanical equipment raised? Are flood resistant materials used? Does the foundation have adequate openings? | Y / N |

\*<https://www.fema.gov/nfip-technical-bulletins>

**D-6**

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| *SITE SPECIFICATIONS – ACCESSORY STRUCTURES* | |
| ***FEMA Floodplain Management Bulletin P-2140 Floodplain Management Requirements for Agricultural Structures and Accessory Structures*\***  ***Note: Variances can only be granted in municipalities that have adopted the New Jersey Model Code Coordinated Ordinance after January 2021.*** |  |
| Meets the FEMA or Model Code Coordinated Ordinance definition of an Accessory Structure and is used exclusively for that use? | Y / N |
| New Construction or Substantial Improvements – Elevation Required? | Y / N |
| New Construction or Substantial Improvements – Dry-floodproofed at least to the LDFE? | Y / N |
| Variance Requested to Wet floodproof and the *New Jersey Model Code Coordinated Ordinance* is adopted? | Y / N |
| If a variance is requested, is justification provided with an explanation of the hardship? | Y / N |
| A Zone – Structure is the size of a one-story two-car garage or smaller and not in a floodway?  ***Note: FEMA guidance notes that the typical footprint is less than 600 square feet (****See* ***page 19 of the Technical Bulletin).*** | Y / N |
| V Zone – Structure is less than 100 square feet? | Y / N |
| Variance granted that restricts use? | Y / N |
| Is the structure anchored? Is mechanical equipment raised? Are flood resistant materials used? Does the foundation have adequate openings? | Y / N |

\*<https://www.fema.gov/nfip-technical-bulletins>

**D-7**

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| *SITE SPECIFICATIONS – ELEVATORS* | |
| **Proposed Elevator meets *FEMA Technical Bulletin 4*\***  ***Note: Please coordinate with your code official when reviewing elevator compliance in the SFHA.*** | |
| Elevation of lowest Electronic Controls/Junction Box/Switch | \_\_\_\_\_\_\_\_\_\_ |
| Lowest elevation of electronic controls is above the LDFE | Y / N |
| Components below the required elevations are composed of flood damage-resistant materials and capable of resisting physical damage due to flooding | Y / N |
| Float Switch Detection System to prevent the elevator cab or lift from descending into flood waters | Y / N |
| Backflow Prevention for elevator shafts | Y / N |
| Architect’s/Engineer’s Certification stating that the enclosure design can resist hydrodynamic and hydrostatic flood forces  ***Note: Elevator shafts must resist flood loads. In Zone A, shafts are not required to have flood openings; in Zone V and Coastal A Zones, shafts are not required to have breakaway walls.*** | Y / N |
| Confirm that any hydraulic elevators below the required elevation have elevated electrical control panels, hydraulic pumps, and tanks; drainage provided for the elevator pit; hydraulic lines, hydraulic cylinders, and buffer springs located to prevent physical damage due to flooding or painted or coated with galvanic or rust-preventive paint | Y / N |
| Confirm that any traction elevator systems have elevated machine rooms, and components in hoist ways below the required elevation must be protected from physical damage due to flooding | Y / N |
| Chairlifts, pneumatic elevators, and platform lifts are reasonably safe from flooding (See ***ASCE24-14 7.5 and related commentary***) | Y / N |

\*<https://www.fema.gov/nfip-technical-bulletins>

**D-8**

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| *SITE SPECIFICATIONS – BELOW-GRADE PARKING REQUIREMENTS* | |
| **See: *FEMA Technical Bulletin 6\*, FEMA Flood Mitigation Measures for Multi-Family Buildings^,* and *NFIP Technical Bulletin 3\** (if applicable, also use Checklist D-4)**  ***Notes: Below-Grade Parking is prohibited in Coastal A Zones and V Zones. Below-Grade Parking is prohibited in Residential Buildings and is allowed only for non-residential portions of Mixed-Use Buildings.*** | |
| An exit is available above the LDFE | Y / N |
| The Below-Grade Parking Garage is not located in a Coastal A Zone or V Zone based upon the most recent best available flood hazard data | Y / N |
| A *Floodproofing Certificate* for the structure has been submitted at permit application (See **FEMA Technical Bulletin 3\***) | Y / N |
| There are no residential uses proposed for the building | Y / N |
| *Emergency Operations Plan* for floodproofing in non-residential portions of the structure has been submitted at permit application that meets ASCE 24-14 6.2.3  ***Note: This shall include meeting the 12-hour flood warning time unless the community operates a flood warning system. If so, the designer will have to determine the available time necessary to implement dry floodproofing measures.*** (See **FEMA Technical Bulletin 3\***) | Y / N |
| All proposed floodproofing products used in non-residential areas meet American National Standard for Flood Mitigation Equipment (ANSI/FM) | Y / N |
| *Inspection and Maintenance Plan* proposed at permit application  ***Note: Inspections are recommended at least once a year and could be coordinated with regular drills.*** (See **FEMA Technical Bulletin 3\***) | Y / N |
| The architect/engineer has provided evidence that the structure can withstand a combination of flood loads (hydrostatic, hydrodynamic, wave, and impact) according to ASCE 7 | Y / N |
| The *Floodproofing Certificate* has been fully completed at project completion | Y / N |

\*<https://www.fema.gov/nfip-technical-bulletins>

^<https://content.govdelivery.com/attachments/USDHSFEMA/2020/06/24/file_attachments/1481529/16-J-0218_Multi-FamilyGuidance_06222020.pdf>