

## Using ASCE-24 Elevation Standards for CDBG-MIT

PLEASE STAND BY FOR REAL TIME CAPTIONS. Testing, testing, testing one, two, three. Please stand by for real time captions.

Let's go ahead and get started. Welcome to today's joint webinar between the Department of Housing and Urban Development and the federal emergency management agency. We will have speakers from the building science branch and FEMA's risk management erectors, we are excited to have this webinar today. I would like to point out the webinar will be recorded, and today's recording and the slides and transcript will be posted onto HUD exchange at a later date. For participants please be mindful that today's presentation is in listen mode only. If you have any issues, technical issues please submit those to the Q&A box on the right side of your screen. As today's webinar is in listen mode only please put your content related submissions on the right side of your screen in the same box. Will monitor those questions and address as many of those as possible at the end of the webinar today. I would like to take a moment to acknowledge our host, thank you for all of your help in getting us set up today, if you want to quickly speak to the survey. Jo-Shani.

Thank you. There is a box called click to eval and that's where we house our level 1 and if you click on that link it is a survey and you will be allowed to take the level I before you leave out of this quote unquote room. Have a great meeting guys. I'm sorry. You will be able to download your presentation and they are in the handout and what the presenters want to share with you guys and that is in the files to download box which is in the link to eval, under the click to eval box. Have a great evening. Spot with that I would like to acknowledge that this is part of the 2020 20 webinar series. We are a little over halfway through the series and today's webinar is titled using ASCE 24 for CDBG-MIT projects. I would like to acknowledge the support from FEMA's risk manager director and their building science branch, and they will be the primary presenters for today. Before I continue, I have a few notes that had leadership would like me to speak to. I'd like to state that they notice the beneficial use of ASCE 24 standards for elevation projects and the nose anchored for grantees to propose an allocation of CDBG-MIT funds for billing co-development and imitation. Is a positive development. However this includes elevation standards for new construction, repair of structures with substantial damage or substantial improvement, to structures and the information described by HUD is a federal registered notice that was published last August for the CDBG-MIT program and I would encourage you to take a look at page 45864. With that being said I would like to emphasize before we go any further that using ASCE 24 may be categorized as a best practice, grantees are not required to use the standard but had does not require the Federal Register notice. That being said ASCE 24 being presented today as an option for consideration by grantees that they can utilize to be in compliance with HUD's elevation requirements. With that I would like to do some introductions. Give me one second. I would like to start off with John Ingargiola. He is the lead physical scientist for the building science branch and FEMA's federal insurance federal at menstruation here in Washington, D.C. It involves a broad range of mitigation activities that include pre-and post-disaster building sciences, science education, working with codes

and standards and reducing billing code strategy and development of technical guidance related to hazard mitigation and coronation with various mitigation partners in the public and private sector. We welcome John today. Thank you so much. We also have Adam Reeder is with CDM Smith. He will be one of the lead speakers today. He is an engineer with 24 years of experience in a wide range of structural engineering projects. He is a nationally recognized expert for building science, especially for wind and flood mitigation. Thank you Adam for joining us today. We have Clay Lloyd, he is with the U.S. Department of Housing and Urban Development and he is a CPD specialist within the division of disaster recovery and special issues. He will speak to our CDBG-MIT slide. Thank you for joining us. Last, I am Roosevelt Grant and I am also with the federal emergency management agency and I am on a temporary assignment and supporting the policy unit within the DRS I division. With that I would like to do a quick overview of the agenda today. First we have CDBG-MIT program overview. this is connected to the fertile registered notice regarding ASCE 24. We have an overview of flood requirements for CDBG mitigation grant. We will be looking at what is ASCE 24 and what is a cover? We are also addressing the question of compliance with ASCE 24 for a CDBG mitigation grant. We will look at providing an overview of ASCE 24 with use particularly related to residential and nonresidential mitigation projects. We will focus on historic buildings, the benefits of using ASCE 24. how you can get access to ASCE 24 and we will provide you with some resources when you choose to utilize that standard. With that I would like to turn over to Clay.

Hi everyone. My name is Clay Lloyd and I work at the department of housing and urban development work I am a CPD specialist who is located in the disaster recovery special issues division manages the CDBG disaster recovery program and the CDBG-MIT program.

So, with that I would like to start off by talking a little bit to our grantees who receive the CDBG-MIT funds. Like to go through the overview of the purpose of the CDBG-MIT allocation. CDBG-MIT was based on the CDBG program, which is the normal, annual appropriation across the U.S.. This program is different than that one, but it is based on it. The goal of that program is to help develop communities, provide decent housing and a suitable living environment and expanding economic opportunities and to focus on low- and moderate-income persons. That is the overview of the permit itself. We published a federal registered notice that went into further defect tell detail. The high-level items in that notice are we wanted projects that met the definition of a mitigation activity. We want projects that address current and future risks as identified in the grantees mitigation needs assessment with a focus of at least 50% on the most impacted and distressed areas. Your project should be CDBG eligible, there is a variety of eligible activities. Lastly all projects should meet a national objective including additional criteria for mitigation activities and covered projects. That is further detailed in the notice. To give you an idea of the type of projects that CDBG-MIT funds can be used for, every structure projects, housing activities, public services, economic development, disaster preparedness and planning efforts. And CDBG-MIT specifically. we are looking to have it increase resilience and reduce or eliminate risk copperheads definition of mitigation. And other requirements is that we have a goal, 50% of CDBG-MIT funds to be used to

benefit low to moderate income persons. Just one more higher-level overview before I hand off to talk more about the ASCE 24 standard. We are also encouraging that grantees are maximizing the CDBG-MIT allocation. We are looking to have them maximize the impact by partnering with other mitigation projects that might be funded through FEMA, the Army Corps of Engineers, the forest service and other engineers agencies. We are also asking that grantees advance the long-term resilience to current future habits for the region and align the programs or projects with other plant federal, state, regional, or local capital improvements and promote community level and regional planning for current and future disaster recovery efforts. With that I would like to hand over to Adam's book thank you Clay.

My name is Adam Reeder and we are a consultant and I've been specifically been working with FEMA building sciences since about 2007. Prior to that I had experience with doing some mitigation projects, particularly elevating houses since about 1999. Today I will walk through quickly ASCE 24.

We are having at technical issue, give us a minute.

Is working now? Can you hear me now? Can you hear me now? It says it's working. My name is Adam Reeder. I have been supporting FEMA building sciences since about 2007 and before that I worked on elevation projects. Since about 1999. With elevating houses that were flood prone. Some instances where CDBG-MIT reference document discusses ASCE 24, Discusses in the long-term planning section as being something that a community would seek to adopt with ASC E seven. We will talk about the many minutes he can understand what they are. The other point is with building codes and hazard mitigation planning there is also some references to ASCE 7 but most importantly and what we are talking about today is elevation standards for new construction, repair of substantial damage or substantial improvements. There are two specific requirements, all structures located in a special flood hazard area, the 100 year floodplain that all of those that are new construction repair substantial damage and substantial improvements be elevated with the lowest floor including the basement and we will talk about that to at least two feet above the base flood elevation. The guidance also discusses that users can adopt ASCE 24 if it results in a higher elevation than the two feet that is required. We will talk a little bit more about this mixed-use requirement and specifically what it means. A lot of what that means is you have buildings that have residential and nonresidential uses in the same building and how the requirements apply. We will spend a little bit more time on that in a few minutes. There are some handouts you guys can download, the handout on using ASCE 24 has a copy of the agenda, the speakers are, a description of flood design terms, acronyms, working in this industry we use a lot of acronyms and I wanted to be clear on those so people do not have questions. There is a guidance document on how to read the flood map and what the different parts of it mean. There is a document on highlights of ASCE 24, flood resistant design and construction and that was put together by FEMA building scientists. We will spend a little bit of time talking about residential structures and we will get used to the FEMA flood proofing certificate, I wanted to make sure you had that in your hands so you could spend some time looking at

that. I will go into two standards, also mentioned at the guidance, ASCE 7 is a minimum design load and associated criteria for buildings and other structures. This is where engineers would actually calculate the load associated with buildings and it tells you how to calculate the loads and how to use the flood loads in addition to the other loads that might be on the building. That might be the people inside the building, the live loads for the dead loads or actual weight of the building. Also the wind load and if you are in an earthquake prone area of the seismic loads. Chapter 5 specifically addresses it and there is a list in the commentary section. That is a more descriptive section on that. Chapter 2 is on load combinations, that is how you appear those loads with the other loads to the building and section 3 is important to look at because it gets into soil loads where you might have a basement area or foundation that is in a saturated soil. Once the flood waters rise and how they combine and how they impact the building pick those are all sections you want to look at if you look at these flood projects. ASCE 7 and ASCE 24 are used together in conjunction. That's the flood standard in the flood standard. It addresses construction materials, design and engineering requirements, it tells you some references for testing of materials and the associated standards. ASCE standards are developed by a consensus process and that means there is balloting by a committee and a public review process. The people on these committees are industry organizations. They have representation.

I think we're having another technical issue. Please stand by.

Can you hear me? I suppose it's the audio.

Adam, I think some of our participants are having issues hearing you, are you calling in? I

I am on my computer audio. You want me to call in?

Yes.

It sounds like there is feedback society might have the computer audio and audio through their microphone on at the same time. That might cause some feedback. Folks say they can hear me. Are better? Can everybody meet their lines if they're not talking?

Everyone please stand by.

Will keep moving. ASCE covers construction material designs and engineering requirements and testing procedures. It is a consensus document and is worked on by several industry organizations, professional associations as well as engineers contractors as well as federal government representation. Is typically incorporated into the building codes through a reference. A brief overview of the sections, section 1 or chapter 1 is a general section with scoping, definitions and basic requirements and the tie to ASCE 7. Chapter 2 are the basic requirements for most river flood areas so areas there are not high coastal hazards. Chapter 3 are high flood risk areas, there is a listing of different types of areas where there may be extreme flood conditions. Chapter 4 is the high hazard areas typically known as V zones. Mainly the shoreline.

These are areas where we would say there is moderate wave action. After five our materials and you see that note down there that says it utilizes modified flood zone designation, that is the coastal waves we'll talk about just a few minutes. Chapter 6 is dry and wet flood proofing and we'll talk about those and their differences when we get into residential and nonresidential sections. Seven is utilities and equipments, chapter 8 is building access, stairs and that sort of thing. Chapter 9 is miscellaneous construction, there is a whole list of accessory structures, decks, porches, garages that sort of thing. Chapter 10 is references and then there is commentary on all of these chapters. The next thing we will talk about are the flood design classes. There is approximately four classes, class one is mainly agricultural type buildings, class two is the majority of buildings, residential and nonresidential, commercial type buildings. Three is large occupancy areas think schools but also a lot of water treatment facilities and class five our essential facilities think hospital, fire, rescue, ambulance, your key needs. Talking about these flood zones that ASCE 24 covers, the V zone is where we have three-foot or greater waves. That are specific requirements for what the foundations need to be built to in these areas and how high the buildings need to be picked we will show you a diagram leader on that talks about the elevation rating. Then we get into coastal A zones where we have one and a half to three-foot breaking waves. ASCE 24 requires similar compliance to the V Zone. These are newly mapped on the recent flood maps. We have a diagram that shows where they are. You are required to use these when the map actually delineates that for the community delineates that. A zone are areas where we have less than 1 1/2-foot waves and in these areas it is your standard compliance that is similar to what you are used to, probably rivers. River green. There is a whole list of different flood zones for these. We tip it typically refer to these as a zones or AE zones. On the old girl maps it is one 230. This is typically where you are in the 100-year floodplain. That is broken into two main sections. There is the flood French which is the outer areas which is filled with darker brown shade areas and then they flood lay which is this area where we want to limit construction within the floodway because that's where the majority of floodwaters are conveyed during a flood event. You see the different types of flood zones and what they mean, in these areas like AO zones they have shallow flooding and there may be a basement elevation in some of those and other times there is not. The rule is the minimum requirement is two feet above the highest adjacent grade. That is a little tricky when you are using ASCE 24 in order to figure out what to do. Pretty much we are equating that to Pete feet above grade two feet above grade is a minimum construction requirement. As we look at these types of buildings and the requirements got referred to new construction, substantial improvements and substantial damage. I want to talk about what substantial damage and improvement are. Substantial damage is once a building is damaged that is constructed within the hundred year floodplain, if it is damaged by anything, flooding, fire, tornado, wind event, if the damage or the cost to repair the structure exceeds 50% of the market value of the structure for its occurred than its determined to be substantially damaged and it needs to be brought into compliance with whatever the communities current requirement is in terms of whatever their floodplain ordinance says. Needs to be brought current. Substantial improvement refers to repair, reconstruction and rehabilitation of a building which equals or exceeds

50% of the market value before the repair started. There is a lot more nuance to this and that is provided in FEMA P7 58. That is the substantial improvement substantial damage desk reference. I go to a web browser and I type in FEMA and whatever that publication number and in this instance it is P7 58 and from there you can do a search and it will come up quickly. ASCE 24 and the national flood insurance program, how did this to match up to each other. ASCE 24 is consistent with the national flood insurance program it meets or exceeds those national flood insurance program requirements, it establishes the new minimum requirements because it has become the standard practice with respect to the codes and a lot of adoptions with states and local governments and in terms of them adopting it. It provides more specific requirements and incorporates the coastal a zone that we talked about. It requires new construction substantial improvement damage construction to incorporate freeboard and will talk about how that changes with ASCE 24. It requires drive flood proofing to consider human intervention. That is when people need to install things or react in order to prepare the building to be dry flood proved.

How does ASCE 24 and CDBG-MIT programmatic compliance? If you don't have new construction or substantial improvements, and a lot of instances you might not be able to comply or required to comply with every provision even if you have said you were going to use it as part of your grant application in terms of adopting it as part of the larger program. You may have some instances where you're retrofitting buildings such as elevating houses where you may not be able to comply completely with ASCE 24 in certain sections may be deemed to comply and I will talk more about how that works when we talk about specific elevation projects where you might leave part of the foundation in place. Just a note that cities and state building codes might require compliance to ASCE 24 and here it's too ASCE 24 might be required for compliance with other funding sources. For instance if you are using this with many of the FEMA grant programs for a more recent disaster than you are likely required to comply with ASCE 24 the way the new policy is written. After September 2016 you will have disasters declared after that date that are required to comply with ASCE 24. You do need to look at your funding source. How to document that we have complied? Make sure the design is constructed to comply with ASCE 7 and ASCE 24. Make sure you document that compliance and it complies with all applicable building codes. That can be a statement or affidavit from a design professional or a statement or affidavit from a local official saying that basically it was completed, and the design meets or exceeds ASCE 24. Design professionals should be made aware that they are going to incorporate that into their design so you need to let them know that as well is on a local level officials need to make sure they can verify compliance. If you are not familiar with it that maiming your engineer may need to go evaluate the billing further with maybe a special inspection just something to consider as you go through those. There is an additional recommendation with in the CDBG-MIT guidance that says you will use the latest issue flood guidance. That could be the latest including things like preliminary flood maps as opposed to your affective maps that could be using advisory based flood elevations, so you have to go through and look at the latest flood data available for that site. Apply that as part of the recommendation. Applying the CDBG-MIT projects with codes and standards and ordinances, the projects

through, the requirements are that they need to meet, state and local ordinances, if no code exists in the proposed project should meet the code that may be a model code that is current you want to make sure you're not in violation of federal laws or regulations or statutes. You are agreeing to all of those things. If you are not in compliance you might have some issues with eligibility requirements. A project should go through a code compliance check. Make sure your meeting the substantial improvement and substantial damage requirements because her consistent for national flood insurance program communities that they are going to actually perform that and it's not even a ASCE 24 requirement. It is a minimum NFIP requirement. Then there are lots of classifications of work that the international codes reference and you will need to make sure you understand what the requirements of the codes are with respect to the classification of work. Coded option versus standards, briefly going through what is code versus the standard, states and committees typically adopt these codes in a foursome in their minimum requirements for the structure, design, materials and hazards. The standards like ASCE 24 and ASCE 7 are usually referenced within sections of the code saying they will be designed in accordance with ASCE 7 and ASCE 24. They are referenced within the building codes as to what needs to be followed. Using it with residential mitigation projects, this applies to single-family, multifamily and residential portions of mixed-use buildings. Typically this is retrofit elevation, think about jacking up a building or something similar or reconstruction of a building. It might be a building that is so damaged that it makes more sense to tear down the building and then reconstruct it. And other instance it might make sense is if you have a building that is in poor condition and if you elevate that building it may knock it down, it may be less expensive to just reconstruct the building. This can also happen when you compare elevation cost versus constructing a new building. There are instances where it is just costly to elevate the building. Drive flood proofing is not an allowable mitigation measure. What flood proofing is basically using flood damage resistant materials and flood openings to equalize the flood loads on the inside and outside of the building walls and that's only allowable for parking areas, building access and storage areas. Prior to design you should look at which provisions of ASCE 24 apply and make sure you will apply it to all of the components that you can make comply with ASCE 24. What are the minimum requirements as far as elevation requirements. As we talk about each of these minimum requirements, the minimum requirement for the CDBG buildings will be the base flood elevation +2 feet in four areas that are in zone A that is to the top of the lowest floor. There are specific definitions of lowest floor. If you have a basement it is included as the lowest floor. That is in your handout. That is where you have four walls below grade and those areas that might require you to fill the basement and no longer have it. The lowest, what would be the next tier floor, there is a requirement of DFE +2 or PFD +3 DFE +2, this is to the lowest horizontal structure, we have a diagram coming up to show you what that is. If we are looking at this, the allowable foundation types in a zone, fill, walls, columns, pile is all allowable. If you're looking at the A zone in the requirement is to the top of that lowest floor if we look at the bottom area, the V zone is where there are high waves in the water is moving quickly and we are not allowed to use Bill or solid foundation walls. We are looking at open foundations, columns and piles. ASCE 24 then requires you to use the

elevation guidance to the bottom of the lowest horizontal structure. That is shown on the right, the crosshatch piece of lumber that would come out toward you. Foundation design in A zone, it will be required to resist flotation, collapse, permanent lateral movement under these design loads. Moving water, Stillwater, buoyancy or uplift and you have to have adequate connections between the foundation and the superstructure which is the main portion of the house. Need to either meet the building code or ASCE 24, whichever is more restrictive. We have some guidance on slab on grade, pier style, open foundations and crawlspaces. A big difference you will see with crawlspaces is they are required to have openings. We want to equalize the water on each side of those foundation walls using flood openings. If we look in the V zone and the customer a zone these are open foundations and we want to minimize the flood forces acting on the foundation. We want to be free of construction, so we don't want foundation walls anyway. We want to let the water flow in and out easily. This is piles, piers, posts and we have a description of where trauma would apply in those areas ASCE 24 would apply in a serious. We are doing design in these areas we need to verify that these elements can resist the loads, apply those loads to existing and new portions of the foundation so if you are elevating a house and you might be using a portion of the existing footings or some section like that that you need to check those loads. How ASCE 24 may not need to be deemed to comply is you might not be able to do all of the checks on the existing footings section that you would with something engineer designed from scratch and was constructed from scratch. That is where you may be deemed to comply. They don't apply when you're talking about elevating the house to a superstructure for if you were building a brand-new house there dissections that would apply to the superstructure of the house and ASCE 24 would apply to the superstructure of the house but mainly we are concerned with the engineer saying the foundation elements meet ASCE 24 will talk about retrofit structures. Enclosures, the walls around the bottom of the building. In a zone they can only these were parking access and storage. Having those walls will affect your premium. There are requirements on those flowed openings about the number of, size and location and if you have breakaway walls, their supposed applet openings regardless. If we're talking about the V zone in the coastal A zone the same uses apply. Anytime you have any sort of wall around, I breakaway wall, with their actual walls they will have to have insurance implications for the building. There are requirements that if you have lattice and screening that meets some certain requirements that that would be preconstruction and it would not be an additional insurance premium. Breakaway walls must fail under a base flood or lesser conditions. The big thing with adopting ASCE 24 in the coastal A zone you need to have flood openings. That is a requirement in ASCE 24, and it also applies to the V zone where there is a requirement for flood openings. If you use ASCE 24 you have a building in the V zone with breakaway walls it is required to have flood openings. Here are some examples of compliant foundations. On the left there is a house that has latticework on the front porch and that circle is a foot opening around the crawlspace wall. If we look in the zones this is a post-disaster photo of a breakaway wall that actually performed as we would expect. These are some technical bulletins, good additional information. bulletin one is for openings in foundation walls, the middle one is on the free of obstruction requirements and technical bulletin number nine is on

breakaway wall requirements. These will basically apply in the zones, but it needs to be constructed with flood damage resistant materials, has a technical bulletin that outlines a lot of what these types of materials are what is that material. It must resist damage, corrosion, deterioration, decay and for 72 hours with minimal damage. Is defined as cosmetic only damage. There are some specific requirements of ASCE 24 that are more restrictive than technical bulletin number two, so you want to look at that. The key difference looking at the zones is the minimum elevation that you're required to go up to. How high you need to be with the flood resistant materials. Utilities must be elevated or if you cannot elevate some of them there is a requirement that they are allowed below if they designed and constructed and installed to prevent floodwaters including backflow from entering and accumulating within the components pick there are some specific requirements on those if you cannot elevate them. These utilities are any electrical, elevators, lifts and you have minimum elevation requirements for each of these areas. There are additional requirements for wave loads that they have to resist. It is transacting +2 BFE +2.

If we are looking at elevation this is lifting up her jacking up a house. Raising it in the zone. This is building the new foundation wall around it and you are allowed to use solid foundation walls provided you are incorporating the flood openings. If you're looking at a V zone or coastal a zone you need to go to the open foundation. Before picture is on the left the walls, to the ground but on the left it is all the way up and they had to use columns. Applying it to elevation projects, there are foundation types that are allowable, and it will be dictated by the flood zone. We showed those earlier, it needs to be able to resist the flotation collapse and lateral movement. If you use existing foundations you have to verify the components could comply with ASCE 24. You need to have the flood openings we discussed. All of these materials below there need to be meeting technical bulletin number two and the utilities need to be elevated or protected as we discussed. If we are talking about mitigation reconstruction this is where you have a building that you need to take down the entire building and building a structure. If you are using ASCE 24. the entire building needs to comply with ASCE 24. There are references within ASCE 24 that say you will comply with ASCE 7. If that is going to be your requirement than the entire building must be treated as a brand-new structure and you will have to meet ASCE 24 and ASCE 7 for the new building in its entirety. If you're saying you will meet ASCE 24 as part of your CDBG-MIT grant then you need to understand that that is what that requirement is going to be. If we're talking about nonresidential this applies to commercial buildings, government buildings, critical actions that we discussed before. And not as a residential portions of mixed-use buildings pick the retrofit elevation and reconstruction would basically be similar to what we talked about for the residential, but this is the addition in this allowing Drive flood proofing. What drive flood proofing is, I will discuss in a minute but this is where you waterproof the wall system in order to prevent water from coming in and anywhere you have openings, doorways, windows, you will put a flood shield in front of that to protect the water from getting to that. That will be the additional topic that we are covering the next few slides for the minimum elevation requirements are based on ASCE 24 design class and again, you need to make sure if you're trying to

use this as part of it and you're not familiar with it you discuss this with the designer and you have additional time set aside for the special inspections. How does it apply to critical action? The critical action requirement is you will meet the BFE was three feet or the 500 year whichever is higher. One of the things to consider is if the 500 year is unavailable in the critical action was within a special flood hazard area than the structure must be elevated or flood proof to at least the BFE +3. What are these collections? Examples would be hospitals, nursing homes, play stations, fire stations or principal utility lines. It could be more inclusive if you are considering your water treatment and wastewater treatment as principal utility lines and that might be more restrictive than ASCE 24 in this instance. Mixed-use building. This might be an apartment building we have apartments on the upper floors and commercial on the lower floor or you have other nonresidential governmental use on that lower floor. This a get broken into nonresidential portions of the mixed-use building of a residential. To simplify the phone bullet, for the nonresidential portion of the building you are required to either elevate those or drive flood proof those to the base what elevation +2 feet. For the residential sections and all of the associated components that would be used by residential sections needs to be elevated to the base flood elevation +2 feet. This gets more tricky when you talk about these buildings. You might have utilities used by both residential sections and nonresidential sections and in that instance you would need to comply with the residential section because it's going to fall into that category. Mainly, where this breakup of residential versus nonresidential happens with respect to the national flood insurance program those specific requirements address residential versus nonresidential so that is part of where these requirements come in from as compliance with the national flood insurance program. This is using a waterproofing measure to protect the building. It is not allowable in the V zone or high flood risk areas. This is just allowed in letter a zone. The requirement is base flood elevation +2 feet or the local requirement that is more restrictive, whichever is higher. There is a three-part requirement if you're getting to the class for buildings, base what elevation +3 feet, 500 year or the DFE when you talk about collections. Applying drive flood proofing, you have to meet elevation requirements, flood zone restrictions and flood velocity restrictions, if the water is moving more than five feet per section you cannot do drive flood proofing. There are material aspects, substantially importable means you not acutely more than four inches of water over 24 hours, sump pumps are required means to remove the accumulator water. Think about the four inches and how you get that out. Egress requirements so getting people out and flood warning times of 12 hours that there are restrictions about. Looking at your covers and shields and make sure they meet the load requirements and if covers and shields are used that you have a flood emergency plan in terms of operations and maintenance when you implement these measures ratifies the authority and plummeting ASCE 24. Looking at these requirements, drive flood proofing is primarily for nonresidential buildings, this could include utility systems, the other place we see people looking at it is with historic residential buildings that are currently used in nonresidential capacity. Think about an old house that might have been turned into a law office or some other type of business that might use these buildings, those may also look at drive flood proofing. We are not looking at the occupancy of the building was

originally constructed but the current occupancy. There are limited instances where you can do drive flood proofing in residential buildings that we are not going to cover that in this primarily because ASCE 24 was designed for substantial improvement and substantial damage and it also eliminates a lot of the requirements we start looking at historically designated buildings. If you opt to drive flood proof there is a flood proofing certificate. Is required by the national flood insurance program for flood insurance purposes but also you are required to submit some documentation of flood proofing to an authority having jurisdiction. Need to check with those and the verification they are currently using. That is actually the types of documentation outlined in terms of what all is required for this new form we have right now is an as built certificate. It was designed and constructed to meet ASCE 24.

It talks about what it is intended for which is basically nonresidential structures and also looking at mixed-use areas where there is nonresidential use, it's importing that builders understand what is involved in it as well as the people signing it. It requires compliance to ASCE 24 when you sign. Has to be signed by registered design professional in the state where the flood proofing is done. Looking at historic structures, these are a few examples of buildings in the Haven, North Carolina appeared these were the buildings I originally looked at and 99 and they were elevated under a FEMA grant. You can see that the older houses were elevated in different ways and they still maintain the historic appearance. What makes a building historic? There are general guidelines. We will not get too specific. Guidelines by the national historic register inventory. There is criteria for evaluation that you may need to look at. Significance in American history, architecture, archaeology and there is also some instances where it needs to maintain the integrity of the location. It might not only be that building but also the area around that you have to look at. We have a web link for that. Historic structure considerations, HUD encourages the historic integrity, you have to look at weighing this protection of the building versus maintaining historic integrity and that is often done not only at the local level but also the state and federal level outside of this process we are talking about. There is a determination that needs to be made and if the historic integrity cannot be maintained and you may need to work with the grant administrator to understand how restrictions apply and if you're planning on using it as part of your grant program ASCE 24 then you have to figure out how it will apply in those instances. You will need to consider these when evaluating the effects, height, scale, portions of the building, architectural character, orientation location, footprint, archaeology, site evaluation and how they impact adjoining structures were a historic district pick those are all factors you will need to look at when you talk about strict buildings. To wrap all of this up, we talked a lot about what ASCE 24 is and what the requirements are but it is a recommendation with respect to the CDBG-MIT grant. it is a tool for you to use and you should really evaluate the benefits of using ASCE 24. It can be used to reduce billing and the contents damage during a flood event. It's an increased factor of safety and when you apply these movement elevation requirements at HUD you will get an additional foot above the minimal requirements. Also looking at all the other requirements, materials and that sort of thing that go into ASCE 24 and how it is a holistic approach to protecting the building during flooding.

It all amounts to a total factor of safety and that's why you want to look at doing it. If you're looking at homeowners or business owners, reduced time out of the house or building after a flood event even if the owners have and maintain flood insurance, it does not cover displacement, there are other programs associated with that a lot of displacement and business loss is not covered in a regular flood insurance policy calling the building in the contents. There is additional benefits with that that you have to think about. It has an ability because you are going above the base flood elevation to provide you with lower flood insurance preeminence premiums. Communities to adopt and enforce ASCE 24 may be eligible for community rating system and its. If you're enforcing this community and you are part of the rating system your policyholders throughout the community might be eligible for an increased break in their flood insurance rates. Getting access to ASCE 24, we have a web address and you can also purchase it through the American Society of civil engineers, I do not have a current price on it, I apologize. It is available for sale there. FEMA resources. Several years ago there was a guidance document about using this with hazard mitigation assistance, retrofitting products and I would encourage you to download a copy of that but there's also highlights of ASCE 24. the 2014 version is encouraged, and it is in your handout, there's also a 2005 edition and FEMA 259 is retrofitting residential structures, this is how the elevation process works in other mitigation options. 348 is looking at your mechanical, electrical and plumbing systems and how to protect those. 55, if you're in a coastal area this is the coastal construction manual. It would be helpful for you to use this not only for residential but non-residential buildings in coastal areas just to understand how flood loads work and 936 is the flood proofing nonresidential buildings. This is the how-to guide on drive flood proofing. We also discussed the technical buildings bulletins and they all have links if you go to the FEMA building science publication page. Would also encourage you to think about getting a copy of the code master, this is a 12 step procedure on determining loads for design with respect to the codes and meanings, flood provisions within the code, it is based on the IBC, IRC, ASCE 7 and ASCE 24 and it includes illustrations and step by step examples. It was done to the international code Council with FEMA support and I provided a link for you to the ICC website. This guidance for using ASCE 24 for hazard mitigation projects, I would encourage you to download and look at this. is not the actual ASCE 24 standard but it gives you overviews and talks about how to use it with the grant and there is helpful checklists and guidelines and how to look at this with respect to benefit cost analysis. That is helpful also when you look at these retrofit projects where you have to deem to comply where you're keeping portions of the existing foundation and you have to figure out how to apply ASCE 24. Remember CDG mitigation requirements are more restrictive with respect to elevation but there are also good guidance within this. I will turn it back over to Roosevelt Grant and let him wrap this up.

Thank you so much. I certainly want to acknowledge the great presentation that you did to help give us background information on the use of ASCE 24. We covered a lot of ground they wanted to remind the grantees here that this is a standard that can be used if you opted to do it. A couple things I want to point out before I get to the exact slides, Adam pointed out some different foundation types and requirements connected to where

the structure is located and we certainly spoke to the standard here and certainly looking at how it may be triggered if you have substantial damage versus substantial improvement. Adam talked about the requirements for critical actions and connected it to the energy lifeline. Is important for critical services before during and after a disaster. I've mentioned this in previous webinars, and I think it's very relevant for today. We talked about in previous webinars the value of mitigation and leveraging federal funds so the publications that of come out in 2017 and 2018 have pointed to the value of mitigation so for every dollar spent in terms of federal funding, particularly when you look at disaster resistant encodes, it could yield benefits. Certainly looking at disaster resistant building codes and standards such as ASCE 24 can be an important aspect of how our grantees can promote long-term resilient strategies. To that end I want to go back to some of the information that Clay spoke of in his portion of the webinar, he talked about the importance of the four goals, looking at how the grantee can look at their current and future risk and he spoke about the importance of leveraging those federal findings. With that let me quickly walk through the HUD goals in terms of utilizing the value of ASCE 24 and meeting the CDBG-MIT goals. Number one looking at support data informed investments and focusing on repetitive loss of property and, clever structure, clearly to the information Adam presented today we see how ASCE 24 provides a consistent standard for flood construction for new construction, repair and repair of substantial damage and substantial improvement. For HUD goal number two. Clay mentioned the building capacity to comprehensively analyze disaster risk and update the hazard negation plan. On the right there are examples of ways to do that way she can do that as a grantee. I would certainly like to point out the value of the mitigation plan, develop mitigation strategies, risk assessment component, it can be leveraged by the grantees in their action plan, and building their mitigation needs assessment. On goal number three, that looks at supporting the policies, driving down disaster costs and protecting critical lifelines. Certainly having a long-term risk reduction effort. To the and use of ASCE 24 can help reduce future disaster costs, reduce building occupant displacement and protect community lifelines, he promptly mentioned the primary utility lines as an example. Last we have HUD goal number four which is maximizing the impact of leveraging your public and private partnerships and correlating with other federal dollars, Clay spoke to that in the beginning. The information we have from Adam takes in look at averaging ASCE 24 as a standard practice providing partners confidence in the long-term resiliency for their investment. This is a high-level quick summary of the information Adam presented and we think both of you and Clay for the information presented today. With that I just want to quickly walk you through some resources, take a look at the link you for the CDBG-MIT notice pick that was published last August and has a lot of requirements and information that Adam and Clay spoke to in the respective presentations. Starting last fall we had the CDBG-MIT 2019 webinar series and all of those have been recorded and transcripts were provided. As a failure action plans, there is relevant and important information for you to help you with your program. Here is an email address, this is for the policy unit within the RSI. If you have questions that were not answered today, or future questions related to mitigation or related to ASCE 24. we encourage you to take a look at emailing the RSI policy unit@Head.gov

if you want to email FEMA director directly you can drsipolicyunit@hud.gov let's transfer to Clay to ask questions of Adam.

I hope everyone enjoyed the webinar. We have some questions in the question and answer section and both John and Adam have already started to go through and answer some of them if you want to take a look at the question and the answers you can see them in the box on the lower right section of the presentation screen. I want to answer one that has not been answered yet that is CDBG-MIT specific. Kurt asked can CDBG-MIT grants be used to cover cost of elevation for lower income property owners to help determine mitigation options?

I don't want to specifically say yes to that. Generally the goal in the notice is to make sure that we are encouraging other potential flood elevation standards above the base requirement. What that means is using the standard they are eligible, it is an eligible use of funds to explore the ASCE 24 standard. How that specific costs get determined to be eligible on a case-by-case basis, reach out to us at drsipolicyunit@hud.gov. A couple others I wanted to highlight, here is one, Adam are you familiar with 406 Mitt funding? Brian asked if you can explain the difference?

406 is the public assistance funding source from FEMA. Basically it is where the money is coming from. Whether it's HUD dollars or public assistance dollars. I don't know what more to say about that. Is the funding source. Spoke great. I can jump in and mention, we are encouraging the CDBG-MIT dollars to be part of a long-term vision and part of other projects. What that means is the part that you are using CDBG-MIT funding for will have to follow the rules and regulation. We have other requirements that you may want to consider for spending the money. You can reach out to us at the email provided or to your grant manager working with you. We also have another one, given that a property is federally funded, other instances where the acknowledgment of conditions [ Indiscernible ] is not required?

That I do not know. We would have to get back with him on that one. If you want to email that one to us we can work on getting a reply to you. I think that is most of the questions. I wanted to highlight some that were already answered in case people have not navigated to it. A question from Heather was how mixed buildings are treated as multifamily and daycare we had some slides on that, they are addressed in the flood design cross tables.

With respect to mixed-use to Billings, hopefully we will have, you guys can check we're talking hopefully weeks. There should be new guidance issued from FEMA floodplain management. There is any publication that is going to external affairs review now that will cover specifically mixed-use buildings. It will cover flood mitigation measures for mixed-use buildings and get into some of the details about how to break out the residential and nonresidential portions of the building and how that can each retreated. Several instances of how you make sure you are compliant when you start dealing with these mixed-use buildings and these areas we have residential and nonresidential areas, but it should add a lot of clarity. We are expecting that in the next few weeks. If you give me a

minute I will get you a number on that FEMA publication. Spoke another to highlight, maybe you could reiterate the answer, is FEMA require compliance to ASCE 24 for PA funding? Is incorporated by reference in minimum standards policy guide.

If you are talking about the PA funds, they pretty much go to nonresidential buildings, it would be covered in the IBC, at minimum by reference to the codes, the fact there is a code requirement with public assistance. Spoke great.

That was a long way of saying yes.

If flood insurance is not available how can we mitigate an existing building?

I guess we're talking about a billing that is in a community that is not a national flood insurance program member? I would assume that is the situation? I think if we can get an email address on that we should probably send that person to the FEMA flood insurance helpline and get them to answer formally that question because we are building science and I do not want to step on any toes with that. The multifamily publication, I would check back in the next few weeks. FEMA T-- 2037, FEMA T -- 2037 it's called flood mitigation measures for multifamily buildings.

Great, thank you. One last question before we wrap up. Observation was made major requirement of PA mitigation is being cost-effective, they noticed if compliance with code and standards does not have to be shown as cost-effective it is inherent in the fact that it achieves a study status of codes, is that a correct observation? If does not have to be shown as cost-effective is inherent as what is achieved.

I will take a screenshot of that and find somebody to answer that one.

Great. It is now 3:27. Anyone who has attended the meeting has any other questions please feel free to email drsipolicyunit@hud.govus at, we covered a lot of ground in this ASCE 24 standard. For grantees that are looking to have a way to spend money to develop a higher standard, this is when you can opt in for. I want to thank Adam for presenting for us and for John for answering a lot of the questions in the Q&A box. I also want to mention if you enjoyed this webinar this is part of a series as I mentioned earlier and you can register at the HUD exchange for a mailing list and for upcoming webinars. With that I want to end today's webinar and thank you, grantees for joining us. [ Event concluded ]