

## **Executive Summary**

*Why does it take some property owners ten years or more to rebuild or settle insurance claims for post-disaster reconstruction? Why is the rebuilt environment often just as vulnerable or more vulnerable to coastal disasters as the previously existing built environment? Why does the rebuilding often disregard environmental sensitivities?*

It is no surprise that coastal communities are vulnerable to coastal storms, especially island communities like Maui County. Post-disaster resources have focused on the immediate health and safety of the population. The Federal Emergency Management Agency (FEMA) has a well-documented, tested and evolving approach for managing disaster response in cooperation with the federal, state and local emergency responders. Led by the Maui County Civil Defense Department, the collective focus is on population health and safety, damage assessment, and providing food, water, shelter, medical services and restoring power, utility, infrastructure and social services. But where does the longer term reconstruction process fit in?

### *After disaster response, then what?*

Every coastal community struggles to rebuild after a disaster because there are so many obstacles including misinformation, lack of information, conflicting government policies, prevalence of structures that do not conform to current building codes, staffing shortages, limited building supplies and permit process inefficiencies. There is no model or template for studying or resolving these issues. These post-disaster reconstruction questions are just now getting the attention and resources needed to fully understand what obstacles exist to *Building Back Safer, Stronger, Smarter!*

A grant from the National Oceanic and Atmospheric Administration's Sea Grant Coastal Storms Program for the Pacific Islands Region has provided Maui County an opportunity to: 1) develop a community-based process to better understand the challenges facing coastal property owners, 2) develop a long-range vision for the post-disaster reconstruction process, 3) develop capacity building and institutional strengthening recommendations to achieve the vision, and 4) develop guidelines and protocols to offer immediate assistance to the public in the event of a coastal disaster. Furthermore, the process and products developed from this project are intended to be useful to other coastal communities.

### *Goals, Objectives & Approach*

The State of Hawaii is one of the most remote land forms on earth, given its location in the midst of the Pacific ocean. Maui County includes three inhabited islands and is one of the premier tourist destinations in the State owing to its long, beautiful sandy beaches, clear ocean waters, and diverse natural and cultural resources. Yet, the islands are subject to coastal hazards including

storm surge, coastal flooding, tsunamis, hurricanes, high winds, large surf, and coastal erosion. Maui's shoreline is dynamic and can change rapidly in response to these natural forces leading to dramatic beach loss, flood inundation, and damage to buildings and property. Given its coastal diversity, geographic remoteness, and the potential to experience a wide range of coastal disasters of unpredictable scale, the Maui County Planning Department sought to create a flexible planning process for post-disaster reconstruction, rebuilding and recovery.

The goal of the project was to develop post-disaster reconstruction guidelines and protocols (RGPs) that will conserve sensitive coastal ecosystems while also streamlining the repair and reconstruction of homes, businesses, structures and private property.

*Guidelines* are suggestions for a course of action that remain flexible for the situation. Guidelines do not hold the force of law the way a rule, regulation or zoning ordinance would; however, guidelines offer a flexible means to inform decision makers, set policy, and implement a planning paradigm in the face of uncertainty.

*Protocols* are a system of instructions to explain how to implement the guidelines to achieve a course of action. Protocols include standard operating procedures (SOPs), best management practices (BMPs), mitigation and adaptation strategies, and agreements between parties, such as Memorandum of Understanding (MOUs). Protocols are a set of instructions that would be implemented during reconstruction activities. This document was prepared for use and implementation by the County of Maui Planning Department and Department of Public Works. Other government agencies will find that the methodology and findings are relevant to achieving their goals and objectives for post-disaster management. The report has a considerable amount of useful information for the public, but it is technical in format and not designed for the public, as the primary audience. However, the specific RGPs developed and presented in this report are intended for public distribution and use, at the Planning Department's discretion.

The project began by evaluating the types of property damage that commonly incur from coastal storms and hurricanes along Maui County's differing coastlines. The project then explored the nexus between the type of shoreline environment and the type of property development or building construction that could result in reducing exposure and improving resiliency to coastal storm impacts. It was recognized that while Maui's coastlines are diverse, there were ten common categories of shoreline environments that influenced storm exposure and increased potential property damage.

From a post-disaster government permitting perspective, there is a range of governmental responses that could be taken to more effectively address building or property damage. In consideration of the severity of damage and sensitivity of local environment, the project created responses designed to get people back into their homes and businesses as quickly as possible, while ensuring that the public health and safety is protected and reconstruction ensures our communities are *Building Back Safer, Stronger, Smarter!* When used in combination, the products developed in this project initiative comprise a powerful toolkit for inclusive community engagement, actionable implementation, prioritized decision making and proactive policy making.

## **Learning From The Community**

Stakeholder and community outreach, especially in remote coastal communities, was an integral component of the project. A multi-faceted outreach program was developed and implemented that included establishing and meeting periodically with a Project Advisory Group (PAG); conducting interviews, presentations and consultations with federal, state and local agencies and experts to fully understand the layers of existing regulatory conditions; hosting community focus group workshop meetings; and informing the public through traditional and social media.

While all components of the outreach strategy were important, it was the community focus group meetings that were the most enlightening and which helped to highlight community-specific differences in addressing challenges and priorities related to post-disaster reconstruction.

A unique, interactive engagement approach was developed for soliciting community input that used a decision matrix “game board”. Across the top of the board matrix were 10 damage types, displayed in order of least to most damage. The vertical axis displayed ten types of environment in order of least to most sensitive. The result was a game board with 100 cells (Figure ES-1) referred to as the “decision matrix game board”. Small focus groups were invited to “play the game” by assigning a permitting priority (fast), medium (inspections required) and slow (current permitting process) for each cell on the matrix.

The interactive game-styled exercise raised awareness of the permitting challenges, generated lively discussion and accentuated the differences in priorities within, and amongst, communities. The communities uniformly identified the need for two types of intermediate permit processes (Fast and Inspection-based with the issuance of Plan Review Waivers) that incorporate best management practices, adaptation strategies and mitigation measures. In addition, the communities identified the need to place a moratorium on certain low priority repairs.

## **Community Recommendations**

Based on five community meetings, attended by over 100 individuals, there were similarities in the focus workshop findings, including the following:

1. **Pre-deputized inspectors:** The limitation of the County’s staffing resources consistently arose as a key concern. In order to provide rapid response, inspectors that are knowledgeable and vetted by Maui County’s Planning Department and Department of Public Works (DPW) could be deputized and ready to deploy at the onset of an event.
2. **Education materials/outreach:** Prior to and during the response and reconstruction phases of an event, the Maui County Planning Department, working with its partner agencies, should develop easy-to-understand educational handouts to guide the impacted community members on assessing, repairing, and reporting structural damages, filing insurance claims, working with contractors, permit processing requirements, managing debris, mitigation and adaptation opportunities, as well as other key or critical rebuilding requirements.

*Post-Disaster Reconstruction Guidelines and Protocols for the Conservation of Coastal Resources and Protection of Coastal Communities, Maui County, Hawaii*

DAMAGE TYPE		MOLOKAI LOCATION	A. INTERIOR BLDG.	B. NON-STRUCT. BLDG.	C. ROOF REPAIR / REPLACE	D. ACCESSORY OR AMENITY	E. LOSS OF UTILITIES	F. BLDG. REPAIR (<50%)	G. BLDG. FAILURE (>50%)	H. SEAWALL REPAIR	I. LOSS OF BEACH /SHOREFRONT	J. BLUFF FAILURE
1. STABLE CLIFF		Not Applicable	A1	B1	C1	D1	E1	F1	G1	H1	I1	J1
2. HARDENED COASTLINE		Wavecrest Condominium	A2	B2	C2	D2	E2	F2	G2	H2	I2	J2
3. LOW, ROCKY VOLCANIC		East of Kumimi Kalaupapa	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3
4. STREAM & GULCH		Kawela East of Puko'o	A4	B4	C4	D4	E4	F4	G4	H4	I4	J4
5. ERODIBLE BLUFF		Not Applicable	A5	B5	C5	D5	E5	F5	G5	H5	I5	J5
6. SEASONAL SANDY BEACH		Kepuhi Beach, Kaluakoi	A6	B6	C6	D6	E6	F6	G6	H6	I6	J6
7. INTERMIT. SANDY BEACH		Hotel Molokai Fishponds	A7	B7	C7	D7	E7	F7	G7	H7	I7	J7
8. COBBLE BEACH		Honouliwai	A8	B8	C8	D8	E8	F8	G8	H8	I8	J8
9. WETLAND/ LOW-LYING		Kaunakakai to Kumimi Kapaakea, Kapuaiwa, Kalama'ula	A9	B9	C9	D9	E9	F9	G9	H9	I9	J9
10. SANDY BEACH		East of Puko'o Harbor Papehaku Dune Lots	A10	B10	C10	D10	E10	F10	G10	H10	I10	J10

**Figure ES-1: Decision Matrix Game Board**

3. **Priority of health and safety:** Selection of which buildings would be authorized for reconstruction in the immediate timeframe would depend solely on prioritizing the health and safety of the community and dedicating resources—material and labor—to expedite getting people back into their homes and businesses up and running again.
4. **Pre-disaster resource plans:** Prior to an event the resources for the community would be clearly delineated and addressed.
5. **One-stop-shop permits:** Provide each local community impacted by the event with access to applying for and receiving permits, related permitting information, and professional guidance, in one single location in order to streamline and expedite the process and reduce commuting times.
6. **In the field permitting:** Empower County Inspector's with the authority to authorize certain minor repairs in the field and during site inspections and/or issuance of Plan Review Waivers for more significant structural damage requiring professionally prepared plans. This would reduce the number of centralized paper submissions for reconstruction and would allow decisions based on site-specific characteristics and the damage experienced, which will allow for many that are displaced to get back into their homes quickly. Such permitting could be facilitated through the use of GPS technology, an iPad or similar device to photograph

damage, and a laptop with Maui County real property and KIVA building permit information pre-loaded. Issuance of the permit could be predicated on Inspector-recommended installation of mitigation and adaptation strategies, which would be incorporated into Plan Review Waiver plan submittals. This would streamline and expedite the rebuilding process, but would have to be transparent and include checks and balances to ensure appropriate decision making.

7. **Homeowner to contractor checklist of required upgrades:** To empower homeowners, and discourage negligent building contractors, develop an educational “checklist” of what would be required by the County when repairing damaged structures or replacing portions of storm damaged structures.

However, as graphically illustrated in the five composite decision matrix game boards in this report, each community had specific priorities. From the findings, local needs were expressed for each community, such as:

#### ***Molokai:***

8. **Hawaiian Homes:** A large percentage of Hawaiian Home Lands on Molokai are located in high risk, flood prone areas. They tend to be clustered in small subdivisions along the shoreline in Kaunakakai and along the east end of the island. Building repairs and reconstruction on these properties are subject to the purview of the Hawaiian Homes Commission (Hawaiian Homes Commission Act of 1920, Chapter 42, 42 Stat. 108) and are not normally subject to County zoning and permitting regulations.
9. Repair and reconstruction of homes are the community’s highest priority, even with houses that are damaged by more than 50% of their replacement value (i.e., substantially damaged). By providing habitable accommodations, residents would not have to leave the Island. Thus, a strong preference was expressed to focus resources and personnel on repairing and reconstructing habitable structures rather than pools, car-ports and other non-essential structures.
10. **Access:** Concern was raised regarding Molokai’s limited island resources, whether the County would prioritize the provision of needed building supplies and inspectors to Molokai, and limitations of access and transportation constraints through Kaunakakai Harbor if the Island of Maui was also impacted by a coastal storm.
11. **Fuel Tank Farm:** The fuel tank farm near the port is at high risk of inundation and storm impacts. Its supply line from the harbor is exposed and not hardened to protect it against severe storm waves, flying debris, or severe erosion of the fuel line footing, or a change in the topography upon which the fuel line rests.

#### ***East Maui***

12. **Access Delays:** The isolation of East Maui is anticipated to create delays in access due to roadway and harbor limitations. The roadway has 617 turns, 54 bridges and 52 one lane segments. The harbor in Hana lacks sufficient depth to accommodate a regular sized barge for supplies.
13. **Resource Prioritization:** Because of these limitations, participants raised concerns regarding the prioritization/allocation of resources and the ability to transit large reconstruction equipment and building supplies to the region.

14. **Smart Phone Application:** There was strong interest expressed in the development of a smartphone application that could expedite damage documentation and the County review and permitting process.
15. **Cesspools:** A preference was given to grandfather in cesspools and waive the State's present requirements to upgrade these systems to septic tank individual wastewater given the logistic challenges of transporting large numbers of these systems, and the cost of their installation.
16. **Swimming Pools:** A moratorium was requested for swimming pools to allow for resources to be allocated to other essential reconstruction.

### **South Maui**

17. **Imminent Danger:** Identifying and expediting needed repairs from damage to property, specifically with issues of imminent danger, was cited as a top priority for South Maui.
18. **Economic Recovery:** Given that tourism is the leading economic driver in this area, reconstruction needs and priorities should be linked to economic recovery, particularly the repair of swimming pools and the protection of sandy beaches and shoreline access. Many of the neighborhoods of South Maui have fragile wetlands and low-lying areas that will be subject to flooding from rising waters, runoff from upcountry rainstorms, and mudflows. Rain-filled areas would result in decreased marine water quality in nearshore areas used by the public and tourists for ocean recreation.

### **West Maui**

19. **Economic Recovery:** West Maui cited economic needs linked to the amenities at condominiums and resorts supporting tourism activities. Pre-identifying geographic risk areas would assist in prioritizing beach recovery.
20. **History and Culture:** The extensive historic and culturally important buildings, sites, and resources around Lahaina are linked to heritage as well as economic recovery and are of considerable concern.
21. **Retaining Walls:** Attention needs to be paid to the many retaining walls along the coastlines of Honokawai, Napili, and Lahaina that are not engineered or anchored to bedrock or impermeable substrate; these may not withstand storm surge or high wave forces associated with a hurricane or coastal storm and could collapse, impacting the local environment and tourism economy.

### **North Shore**

22. **Utilities:** Restoration of utilities was cited to be of great importance to North Shore communities.
23. **Cesspools:** Many older residences rely on cesspools rather than septic or sewer systems for wastewater treatment, and requirements for their conversion could be onerous.
24. **Accessory Repairs:** A moratorium on accessory repairs (not including 'ohana) would prioritize allocation of limited rebuilding resources and enable returning people back into their repaired/reconstructed homes and businesses.

## **Current Regulatory Paradigms**

Research of national, other coastal states, and local case studies of post-disaster reconstruction efforts tied to a thoughtful evaluation of local regulatory processes, revealed a long list of challenges associated with the current Maui County and State regulatory paradigm in the face of a coastal disaster. It became apparent that if the current permit processes were improved, then post-disaster reconstruction would occur much faster, be less costly, and produce communities that would improve disaster resiliency by *Building Back Safer, Stronger, Smarter!*

While the grant proposal did not anticipate the need to outline a strategy for overhauling the current permitting system, this report provides a substantial list of capacity building and institutional strengthening recommendations designed to improve the current regulatory permitting system.

Maui County is encouraged to:

1. Work with the Governor's legal counsel to avoid suspending the laws that empower Maui County to authorize private property actions to respond to coastal storm damage in the Governor's Disaster Declaration. Past declarations have hampered reconstruction efforts and jeopardized coastal resources and beaches.
2. Revise the current DPW emergency permitting system to triage repair and reconstruction requests to expedite those that create safe, habitable living spaces, especially for businesses that provide essential services (e.g., food, power, materials, health / social care). The process should also be clarified as it relates to non-conforming structures and automatic approvals, given the potential for a large, unmanageable influx of permit requests.
3. Empower the Directors of DPW, the Maui County Planning Department, or both, to enact temporary moratoriums on certain types of permit requests and new construction, as determined by the Director of the Maui County Planning Department, for streamlined workflow after a disaster event.
4. Educate the public on the drawbacks of repairing or reconstructing after a storm event without government approval and opportunities for long term risk reduction through a structured public educational outreach program.
5. Implement a Deputy Inspector program.
6. Provide portable laptop computers with plat maps, real property tax, and Kiva records, on the hard drive, handheld GPS units, and digital cameras with data acquisition ability to teams of inspectors and for preliminary disaster assessment at remote locations (Hana, Lanai, Molokai). Having the capability to issue some minor repair permits in-the-field should be considered to reduce the influx of permit requests.
7. Implement mutual aid agreements to share staff and resources between and/or among jurisdictions.
8. Develop MOUs and an emergency decision framework for shoreline erosion and shoreline hardening between agencies involved in regulating coastal areas.

9. Discuss empowering SHPD-approved archaeologists and Maui County cultural resource planners with autonomy for making determinations on historic structures located in a flood zone.
10. Discuss DOH requirements to upgrade cesspools after a disaster, particularly in remote locations given the logistical challenges of transporting septic tanks.
11. Solicit the ORMP for MOUs related to sharing staff to review and process post-disaster repair and reconstruction proposals and/or conduct inspections.
12. Work with FEMA, NFIP, and the State NFIP to allow for reconfigurations of flood prone portions of a building without loss of NFIP grandfather or Maui County non-conforming clauses.

## **Guidelines & Protocols**

The RGP's offer clear guidance on a range of topics such as how reconstruction will be permitted, when adaptation and mitigation will be required, the effect of substantial damage determinations, and how non-conforming structures will be addressed by Maui County. The RGP's identify a number of potential pitfalls private property owners should avoid when repairing or reconstructing their homes, businesses or property after a disaster event.

Created as a potential handout or basis for messages to the public, the **Guidelines For Post-Disaster Reconstruction in Maui County** has been developed to help property owners more effectively manage their repair and reconstruction process; and also reduce the risk of property damage from future flood events and coastal hazards. Seven guidelines address 57 different topics and offer 36 community-specific instructional messages.

A first consideration after a disaster event will be to determine whether the building or structure incurred substantial damage and thus must be reconstructed, or whether the building or structure can be legally repaired in place. Substantial damage is an explicitly defined technical term used by FEMA, the State of Hawaii, Maui County and insurance agents when the cost of reconstruction is more than fifty percent (50%) of the building's pre-storm market value. In contrast, a repair is damage that will cost less than fifty percent (50%) of the building's pre-storm market value to fix, based on the building's replacement cost.

The RGP's have been integrated into a **Substantial Damage Flow Chart** that assists the property owner to determine which protocols are relevant for the owner's property. The chart would be used in conjunction with **Protocols for Post-Disaster Reconstruction in Maui County**, which offers 26 different procedures for obtaining Maui County approval of post-disaster reconstruction or repairs and incorporates ten common categories of storm damage to buildings, structures and property. The use of the flow chart in conjunction with the RGP's would guide the public in avoiding costly mistakes, inform regulators and property owners, and clarify the post disaster reconstruction and repair process.

## **Future Regulatory Paradigm**

Based on research of other states' approaches, hurricane disasters, and a keen understanding of local regulatory procedure, the project developed an expeditious post-disaster reconstruction permit processing model that should be considered for future use (Figure ES-2). The model crystalizes the extensive research, findings and recommendations of the project and provides actionable steps that can be taken by Maui County to respond to public demand for post-disaster repair and reconstruction. The model can be used on a stand alone basis or in conjunction with the priorities received from the community during the workshops (Figure ES-3).

Consistent with the project's key objectives, the proposed model would help:

- Expedite the post-disaster rebuilding process;
- Triage actions to address immediate and long-term needs;
- Protect sensitive environmental, historical and cultural resources;
- Improve response in a planned manner without arbitrary and capricious decisions; and
- Incorporate mitigation and adaption strategies into reconstruction to further community resilience.

The post-disaster reconstruction permitting model includes the following five elements:

### **1. Pre-disaster Avoidance.**

Strong pre-disaster avoidance planning is necessary to reduce the extent of damage caused by an event. Before a disaster occurs, it is prudent to take measures to ensure that the built environment is more resilient to coastal storm hazards. In theory, such measures would significantly reduce the number of buildings damaged by storms, which would reduce the volume of permits that would require processing following an event. .

### **2. Develop Post-Disaster Staffing Program and Support Facilities.**

Key recommendations include the following:

- Establish temporary, but fully equipped, one-stop permitting centers in each community affected by a disaster.
- Develop temporary staffing programs appropriate to the type and scale of the disaster.

### **3. Reinforce, Strengthen and Streamline Maui County's Existing Emergency Permitting Process.**

### **4. Develop Effective Post-Disaster Community Messaging.**

- Building off community input obtained during this project, a wide range of outreach messages are offered as area-specific guidelines in Appendix C.
- The Director of the Planning Department could mix and match these messages to the situation at hand.

### **5. Operationalize a Post-Disaster Reconstruction Task Force.**

The post-disaster reconstruction permitting model expedites permit processing based on the type and extent of damage while encouraging the use of BMPs and implementation of mitigation and adaptation strategies. The model requires mobilizing a damage assessment team and an inspection team, establishing a one-stop-permit shop in affected communities, and implementation of an integrated communication strategy. The model also offers an efficient and predictable mechanism to facilitate repairs and reconstruction of private property, improve community resiliency, and protect valuable coastal resources.

### ***Achieving the Vision***

The project identified areas where post-disaster permitting requirements that could not be adequately met with existing staff, inspectors, and resources, operating within the present framework. To address these gaps, 87 recommendations are provided to address these unmet needs. The recommendations cover ten key issues that list specific tasks, associated actions, and an estimated time frame for their completion.

Successful accomplishment of these tasks will take resources, political will, agency cooperation, and changes to our community plans, recovery plans and development regulations. The recommendations will not be addressed overnight but could occur within 5 years. In the interim, the Maui County Planning Department could provide property owners with some immediate post-disaster relief through a set of guidelines and protocols that would be developed based on current permitting conditions. The guidelines and protocols would address the problem of miscommunication and assist the community in navigating the permitting system while raising awareness of pitfalls to avoid. As the recommendations are implemented, the guidelines and protocols could be updated and revised to reflect changes in the normal and post-disaster regulatory permitting environment.

In summary, this forward-thinking project, empowered by its many participants, from PAG members to community focus group participants, has improved Maui County's awareness of its post-disaster reconstruction challenges and opportunities. It points to actions that should be taken to get people back into their homes and businesses up and running as soon as possible, and provides a roadmap for reconstructing its communities to be more resilient to coastal storms because they will be *Building Back Safer, Stronger, Smarter!*

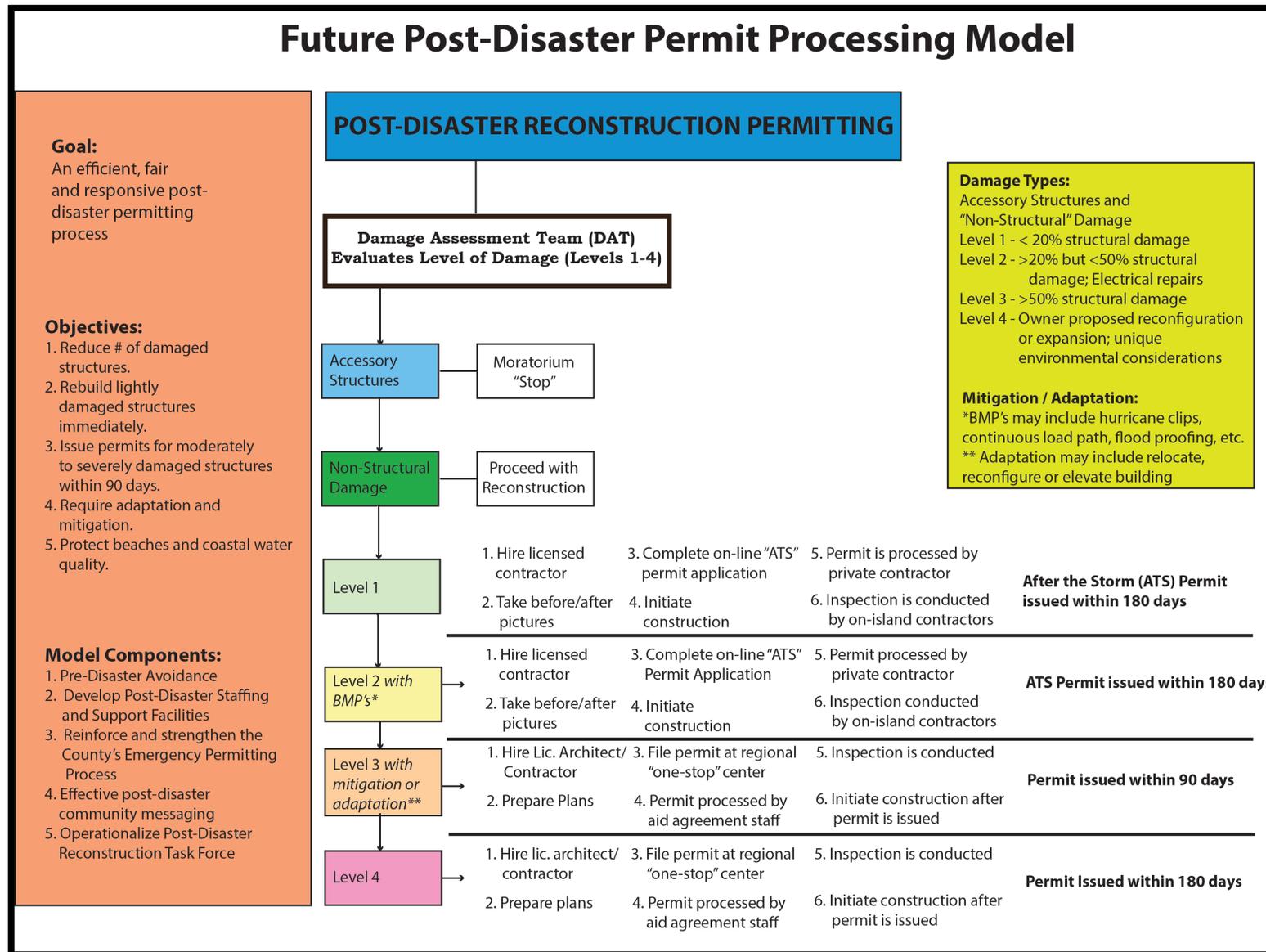


Figure ES-2: The Post-Disaster Reconstruction Permitting Model

*Post-Disaster Reconstruction Guidelines and Protocols for the Conservation of Coastal Resources and Protection of Coastal Communities, Maui County, Hawaii*

MAUI COUNTY										
Coastal Exposure & Environmental Sensitivity	Types of Damage									
	Interior Building Repair	Non Structural Building Repair	Roof Repair or Replacement	Accessory or Amenity Structure	Loss of Utilities	Building Repair (<50%)	Building Failure (>50%)	Seawall Repair	New Seawall	Grading or Retaining Wall
Stable Cliff or Sea Pali	1	1	1	1	2	2	4	2	4	3
Hardened Coastline	1	1	1	1	2	2	4	2	4	3
Low, Rocky, Volcanic Coastline	1	1	1	0	2	2	4	3	4	3
Stream or Gulch	1	1	1	0	2	3	4	3	4	4
Erodible Clay or Sandy Bluff	1	1	1	0	2	3	4	3	4	4
Intermittent or Wet Sand Beach	1	1	1	0	2	3	4	3	4	4
Pebble or Stony Beach	1	1	1	0	2	3	4	3	4	4
Wetland or Low-Lying Area	1	1	1	0	2	3	4	3	4	4
Normally Dry Sandy Beach	1	1	1	0	2	3	4	3	4	4

Figure ES-3: Reconstruction Priorities and Level of Regulatory Review When Using the Post-Disaster Reconstruction Permitting Model

Legend	Level 0	blue	Temporary moratorium on repairs or reconstruction
	Level 1	green	Expedited permitting process
	Level 2	yellow	Inspection based permitting process - best management practices required
	Level 3	beige	Inspection based permitting process- mitigation and/or adaptation required
	Level 4	red	Normal, traditional permitting process

**Maui County Post-Disaster Reconstruction Guidelines & Protocols**

This flow chart should be used in conjunction with the **Guidelines (A-G)** and **26 Protocols** to help plan and expedite your recovery efforts

