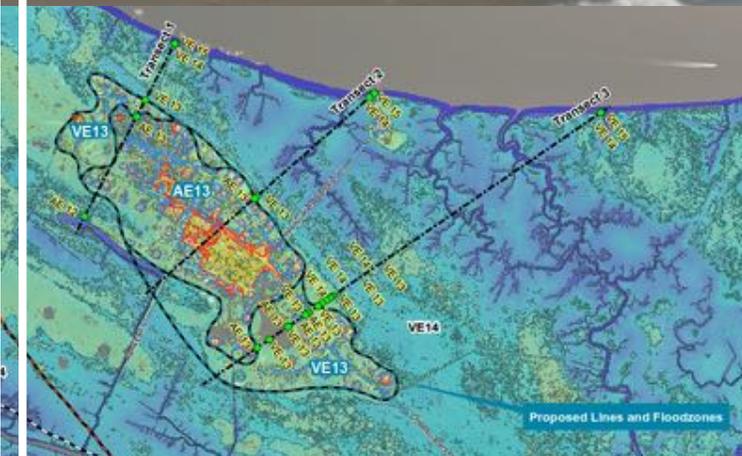


ATM

DESIGN
ENGINEERING
CONSULTING

APPLIED TECHNOLOGY & MANAGEMENT, INC.



Flood Zone Services

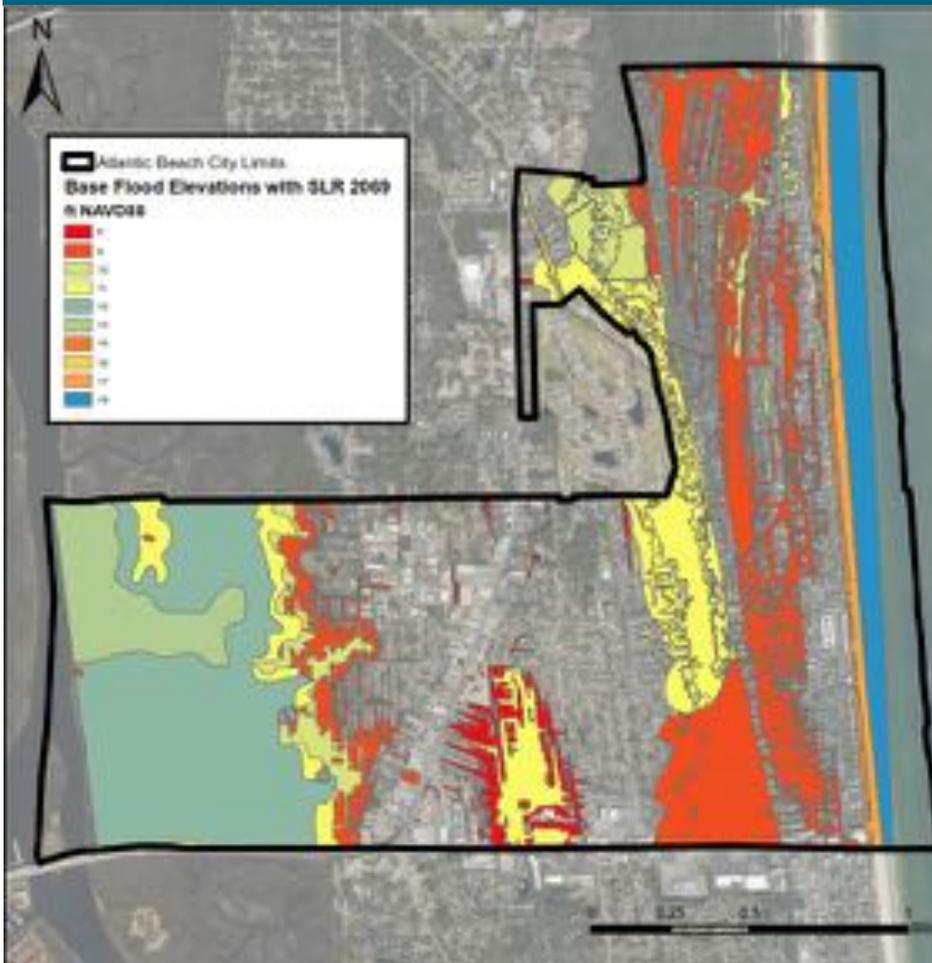
Who We Are

ATM provides specialized consulting and engineering services to public and private clients on a wide range of unique issues encountered within flood risk zones.

Coastlines, waterfronts and surrounding lands are prized locations for local governments, property owners, developers and investors. However, properties located in flood risk zones, especially within FEMA flood zones, present a unique set of challenges. ATM is well versed in the complex processes of coastal, riverine and waterfront flood risks and the technical guidelines regulating FEMA-designated flood zones.

Utilizing our expertise results in significant insurance premium savings, coastal and flood hazard risk reductions, and increased opportunities for new, responsible development or redevelopment.

Public Sector



Public agency officials must consider a range of factors in the planning, design, construction, and operation of public works, projects, and programs in coastal and flood risk zones. Effective FEMA Flood Insurance Rate Maps (FIRMs), the preliminary FIRM approval process, existing flooding issues, maintenance, climate change, sea level rise, and funding mechanisms should each be accounted for during short- and long-range planning.

Many local entities understand the governing issues and are proactively seeking solutions. However, they commonly lack the resources and specialized technical expertise required to successfully implement solutions. **ATM provides the technical expertise, guidance and support to realize short- and long-term goals of these public flood risk reduction and resiliency initiatives.**

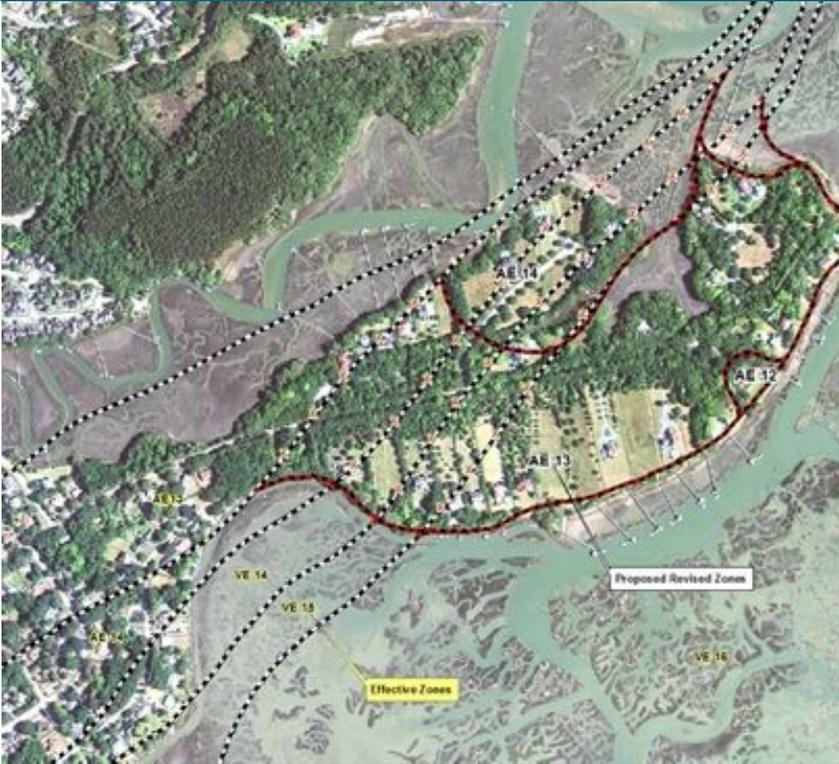
Specialized Services

- Coastal and Stormwater Flood Hazard Analysis
- Infrastructure Vulnerability Mapping
- Sea Level Rise Flood Mapping
- Preliminary FEMA Flood Map Appeals
- Effective FEMA Flood Map Revisions
- Development of Governmental Forms, Guidance Documents, and Review Protocols
- Technical Support to Floodplain Managers
- Community Rating System (CRS) Assessments and Consulting
- Hazard Mitigation Assistance (HMA) and Grant Funded Projects

Project Highlight: Coastal Hazard Assessment and Sea Level Rise Mapping, Atlantic Beach, FL

As part of a multi-disciplinary team, ATM conducted the coastal hazard assessment component of a municipal-wide vulnerability assessment, ATM evaluated long-term coastal flood risks for Atlantic Beach, FL using future sea level rise (SLR) projections and more intense hurricane conditions. The overall vulnerability assessment reflects forward-thinking modeling while adhering to FEMA methodology in projecting the likelihood of 100-year flood events 25-, 50- and 100-years in the future. The assessment produced a series of flood maps, using FEMA methodology but accounting for SLR and increasing storm intensity, which FEMA does not do. The net result is the City now has a new set of flood insurance rate maps that consider SLR and climate change conditions.

Property Owners, Management Companies and Homeowner Associations



Property owners, management companies, and homeowner associations often have the daunting tasks of deciphering FEMA maps, updates and technical guidelines to understand insurance premiums based on maps that could be out of date or incorrect. Oftentimes, an ATM site-specific analysis indicates that a home or entire neighborhood is actually at lower risk to flood damage than reflected on FEMA flood maps.

To date, in coastal South Carolina alone, ATM has successfully obtained more than 40 Letters of Map Revision (LOMRs) and Conditional LOMRs for properties where existing flood maps were found to be inaccurate **This represents hundreds of individual home, condominium, and similar property owners who have been rezoned from the high risk and high insurance premium V zone to lower risk and significantly lower insurance premium A and X zones based on ATM remapping.**

ATM's expertise and experience with the mapping process allows us to quickly review a property to advise our client if they should pursue flood zone remapping.

Specialized Services

- Letter of Map Amendment (LOMA)
- Letter of Map Revision (LOMR)
- Letter of Map Revision based on Fill (LOMR-F)
- Technical Support for Construction of Pools, Decks, and Docks in Flood Zones
- Specialized Consulting-Engineering for Siting and Construction of New Residences
- VE Zone Fill Analysis - "No Rise" Certifications
- Expert Witness Services and Litigation Support

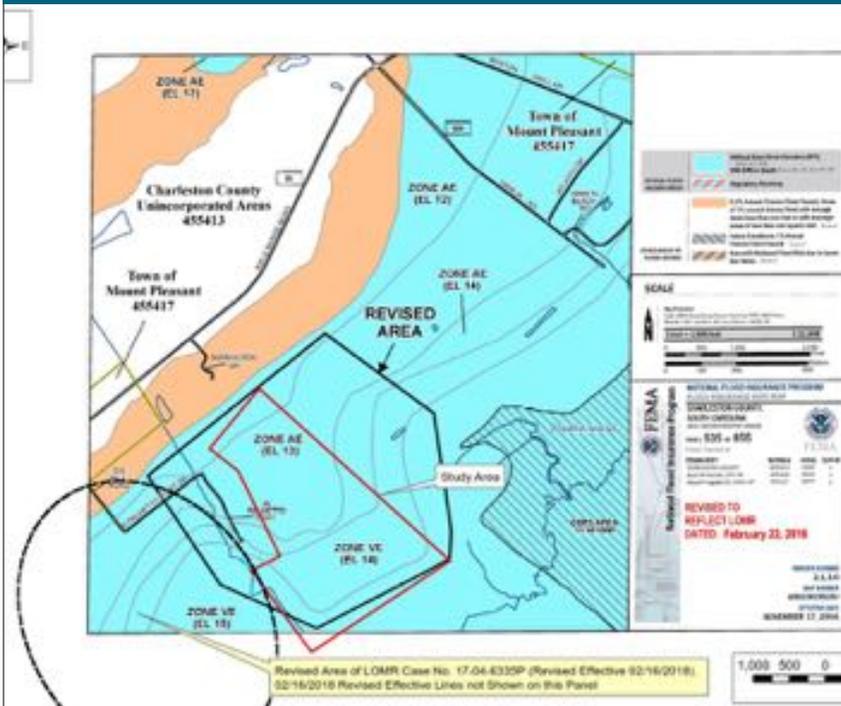
Project Highlight: Fort Lamar Neighborhood FEMA Map Revision, James Island, SC

ATM was contacted by a group of homeowners to determine if the effective flood maps in their area accurately depict the true flood hazards and zones. The isolated peninsula neighborhood is located within the tidal marshes behind a barrier island.

ATM's feasibility analysis determined that using improved topographic survey data and a FEMA-approved wave transect analysis, that a majority of the area could be remapped as FEMA AE zone versus the effective VE zone, thereby reducing insurance premiums.

A detailed coastal risk analysis was conducted according to FEMA guidelines. ATM submitted a LOMR package to FEMA reflecting the proposed changes and coordinated with FEMA on additional requests and analysis until the changes became effective. In the end, all structures in the study area were successfully changed from a VE to AE zone. Substantial savings on homeowner flood insurance premiums were realized based on the revised maps.

Commercial Real Estate Owners and Developers



Acquisition of built properties or (re)development of sites within flood zones are significant activities that require careful consideration of existing and future flood maps, technical construction restrictions, and opportunities for risk and cost reduction. Ownership of these sites requires high dollar operating costs in the form of flood insurance premiums. The sale, purchase, programming, permitting, construction, and operations can all be impacted positively or negatively depending on consideration of flood zone issues throughout the process.

ATM's specialized flood zone consulting and engineering services provide alternatives for integrating flood risk reduction structures into planned site features, acquiring variances and engineering support for atypical site grading, and revising existing flood maps using updated site plans. **These alternatives increase redevelopment program options, simplify project constructability, and offer significant reductions in construction costs and required flood insurance premiums.**

Specialized Services

- Specialized consulting-engineering to integrate flood risk reduction measures into initial site planning
- Liaison to regulatory/governmental agencies for flood zone planning, permitting and construction requirements and potential variances
- Letter of Map Revision (LOMR)
- Letter of Map Revision based on Fill (LOMR-F)
- Conditional LOMR (C-LOMR) and Structural Solutions
- Certification of Existing Structures for Flood Risk Reduction
- VE Zone Fill Analysis - No Rise Certifications

Project Highlight: Liberty Hill Farm FEMA Trip Wall and Conditional LOMR, Mount Pleasant, SC

Certifying structures to FEMA 100-year storm conditions requires a comprehensive effort but can provide significant benefits to larger projects (i.e., condominiums, commercial structures, residential neighborhood development). The purpose of the Liberty Hill project was to maximize AE zone acreage for development and reduce VE zone construction restrictions. FEMA's Conditional Letter of Map Revision (CLOMR) process was utilized for this purpose.

ATM worked with developers, architects, planners, and site engineers to incorporate a small barrier structure into the site plan development. A "trip wall" was designed, permitted and constructed along 2,000 feet of estuarine shoreline to convert 50 acres of VE zone to developable AE zone. ATM performed wave modeling and trip wall sheet pile design loads. ATM staff worked with geotechnical and structural engineers to design the trip wall to FEMA 100-year storm conditions.

International Developers



Project Highlight: Six Senses Resort Coastal Hazard and Resiliency Study, Providenciales, Turks and Caicos

ATM prepared an engineering assessment of coastal flood hazards that recommended coastal development setbacks, building elevations, and protection schemes. The coastal hazard analysis focused on the potential effects of passing tropical storms and hurricanes as well as sea level rise (SLR) impacts. The analysis resulted in a flood and coastal risk map of the project area which shows the base flood elevations, design finished floor elevations, and construction setbacks for different zones throughout the development. The approach was adapted to calculate the same design parameters for future SLR scenarios. ATM proposed different design alternatives to integrate into the overall master plan for coastal risk reduction. The analysis provided insight into required construction types, associated risks, and program planning options. Based on these results, ATM worked with the developer and resort master planners to recommend a holistic design approach to achieve a resilient coastal design, reduce risk, and maximize project potential.

As a U.S. federal agency, FEMA's flood zone analyses and flood insurance rate maps do not extend beyond U.S. territories. For international projects, this presents a double-edged sword. On one hand, there are typically less (or no) restrictions relative to flood zones, construction requirements and insurance guidelines. On the other, no comprehensive coastal hazard and flood studies typically exist to provide guidance on the resilient planning, design and construction of these developments which places many at risk of damage or destruction. Additionally, the financing, insurance and sale of these developments are more commonly evaluated on whether or not they were properly planned and designed to account for flood zone risks.

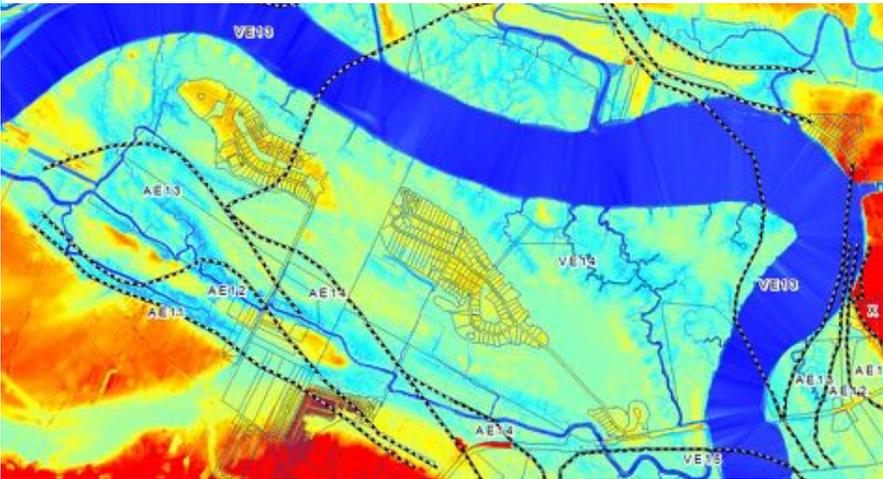
To assist international property owners and developers, ATM conducts detailed coastal and flood risk studies based on FEMA methodology to develop site-specific mapping products to help plan and design development in flood risk zones.

Specialized Services

- Desktop Analytical Coastal Hazard Assessments of International Sites
- Coastal Hazard Mapping of International Sites based on FEMA's Mapping Methods
- Project Design Life Events and Sea Level Rise Scenarios
- Site Plan Reviews and Recommendations for Incorporating Coastal and Flood Hazard Risk Reduction Measures into Planned Site Elements
- Erosion Assessments and Incorporation of Site Plan Alternatives that can Impact Flood Risk and Hazard Mapping
- Development of Construction Recommendations, including Coastal Setbacks, Finished Floor Elevations and Critical Infrastructure Siting

Why Choose ATM?

Public Sector



ATM provides specialized technical expertise, guidance, and support to realize short -and long-term goals of public sector flood risk reduction and resiliency initiatives.

Property Owners, Management Companies and Homeowner Associations



ATM's remapping efforts have resulted in hundreds of individual home, condominium, and similar property owners who have been rezoned from the high risk and high insurance premium V zone to lower risk and significantly lower insurance premium A and X zones.

Commercial Real Estate Owners and Developers



ATM's specialized engineering provides opportunities to increase redevelopment program options, simplify project constructability, and offer significant reductions in construction costs and required flood insurance premiums for the owners.

International Developers



ATM's professionals conduct detailed coastal and flood risk studies based on FEMA methodology to develop site specific mapping products to help plan, design and construct resilient development in flood risk zones.



APPLIED TECHNOLOGY & MANAGEMENT, INC.

Founded in 1984, ATM is a design, engineering and consulting firm providing coastal, waterfront and water resources engineering services to clients worldwide.

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**Coastal, Waterfront &
Water Resources Engineering**