Florida Division of Emergency Management

Hurricane Loss Mitigation Study for Commercial Risks in Florida

Summer 2009

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Contact Information

If you have any questions regarding this document, contact:

AIR Worldwide Corporation
522 East Park Avenue
Tallahassee, FL 32301
USA
Tel: (850) 222-0350

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Introduction

Background

The Florida Division of Emergency Management (FDEM) is the state agency charged with mitigation of, management of, and recovery from natural disasters and other civil emergencies. Given its mission, senior agency officials have a keen interest in understanding the nature and vulnerability of the stock of commercial structures in Florida to hurricanes and their two main threats, wind and storm surge. They also want to know what construction attributes and features reduce the financial risk (property damage) from these threats at a structural level around the state.

The State Hazard Mitigation Officer led FDEM's engagement of AIR Worldwide Corporation (AIR) on January 26, 2009 to perform a comprehensive study of hurricane losses and loss mitigation for Florida commercial risks in several stages:

1. **Exposure Profile** – understanding the scope and scale of the financial risk by using AIR's proprietary exposure databases to estimate the replacement values of commercial structures (including those used for residential occupancy), their contents, and potential time element (e.g. business interruption or loss of use) losses to those properties, at levels of county, construction type, and occupancy type.
2. **Hazard Profile** – understanding the current property damage risk to these structures from hurricane wind and storm surge, by applying AIR's proprietary model simulating 10,000 years of potential hurricanes to the existing exposures, with results examined at levels of county, construction type, and occupancy type.
3. **Mitigation Analysis** – assessing the reductions in annual expected insured losses attributable to beneficial construction features for hypothetical individual risks in various areas of the state, using AIR's proprietary individual risk vulnerability model.
4. **Reporting** – synthesizing the data and analysis results and drawing key conclusions and actionable recommendations for FDEM and related public policymakers and stakeholders.

AIR is well qualified to assist FDEM in understanding the current Florida commercial exposures, the hurricane risk to those exposures, and the impacts of hurricane loss mitigation features on the level of risk. AIR is an independently operated, wholly-owned subsidiary of Insurance Services Office, Inc. (ISO), the leading source of information about hazard risks, and incorporates proprietary data from ISO's many databases as well as AIR's own into its risk assessment consulting services and software technologies. AIR pioneered the development of catastrophe simulation research, methodology, and technology more than twenty years ago, and continues to incorporate leading proprietary research into the hurricane hazard, the vulnerability of structures to wind loads, and the financial impact of property damage into its products and services.

This report documents our resources and approach and presents our findings to FDEM.

Reliances and Limitations

AIR's exposure databases represent our most complete view of the aggregate replacement values, but all databases have limitations. We have developed our exposure estimates using data from multiple sources, along with certain broad assumptions, which we believe are reasonable, regarding gaps in the data.

Although AIR's simulation methodology is state-of-the-art for estimating potential catastrophe losses, it has certain limitations. It is based on mathematical/statistical models that represent real-world systems. As with all models, these representations are not exact. The simulated events generated by the AIR model do not represent catastrophes that have occurred, but rather events that could occur. The AIR model relies on various assumptions, some of which are subject to uncertainty. Accordingly, the loss estimates generated by the model are themselves subject to uncertainty. As a result of our ongoing process of internal review, we refine and update our model assumptions from time to time in light of new meteorological and other information as such information becomes available. Such refinements and updates may materially alter the loss estimates generated by the AIR model.

Note that extreme occurrence losses - that is, losses in excess of those estimated by the model - are possible, although they have a very low probability of occurrence. Nevertheless, it should be understood that the largest simulated event losses do not represent worst possible scenarios.

The loss estimates and their associated probabilities are estimates of the magnitude of losses that may occur in the event of such hazards; they are not intended to predict future events. Actual loss experience can differ materially. The estimates are intended to function as one of several tools for use in analyzing estimated expected and potential losses from certain hazards. The assumptions that AIR used in creating them may not constitute the exclusive set of reasonable assumptions and methodologies. The use of alternative assumptions and methodologies could yield materially different results.

Exposure Profile: Current Stock of Exposed Commercial Property in Florida

AIR's Exposure Database

We developed our estimates of replacement value[1] for Florida commercial risks using the proprietary aggregate exposure databases. Underlying AIR's software products, these databases are normally used to develop market share-based or "industry-wide"[2] estimates of damage or insured losses from catastrophic events - either simulated future events, or re-creations of historical events. A comprehensive update of these databases is performed annually, using component data from multiple sources internal and external to AIR.

Our highest-resolution exposure database, containing estimated values as of year-end 2007, was the basis for the results in this phase. Assembly of the year-end 2008 values is underway and when complete, it would be possible to update these results. The results include only Florida data, and include data for all identified "insurable" exposures, irrespective of the level of insurance on those risks.

In this database, commercial risk counts are derived from various data sources. Information on the counts of commercial buildings, the number of establishments within these buildings, and the occupancy information for each establishment is obtained.

Information on building attributes is also collected. Construction type, height and floor area are some examples of building attributes. This type of data is used in conjunction with construction cost information in the development of replacement costs. AIR construction cost engineers develop costs for commercial building types by occupancy. An additional factor is applied to these costs to account for local variations in construction costs in terms of material or labor prices. In particular, factors are included for remoteness and island locations. The calculated replacement cost is then applied to each individual building location.

Contents value is calculated as a percentage of building replacement value and varies by occupancy. Values are estimated from reports by the Bureau of Economic Analysis and ISO client data. Contents values are made up of values for fixed equipment, internal fixtures, and inventory. The inventory amounts are provided by location in the input data. Time element exposure is based on an analysis of ISO commercial data, and expressed as a proportion of building and content replacement values combined. All contents and time element proportions vary by occupancy classification.

[1] Unless otherwise qualified, the short description "exposure" or "value" in this report always refers to replacement value. Replacement values are the fundamental quantity used in catastrophe modeling, as opposed to market values, insured values, or depreciated cash values.

[2] "Industry" exposure or loss estimates in catastrophe modeling typically mean "to the insurance industry" from their policies and contracts, not specifically to other industries or their facilities.

Distribution of Replacement Value by County and Coverage

Exhibit 1 shows statewide total exposures and their distribution by county, in alphabetical order. It also breaks down exposure into estimated structure, contents, and time element categories. Exhibit 2 contains identical data sorted by exposure size, from largest to smallest.

Statewide total commercial risk exposure is approximately $1.3 trillion, comprising structure exposure of over $815 billion, contents exposure of $300 billion and time element of nearly $182 billion. AIR estimates exposure for coverage of "appurtenant structures" under commercial policies and includes it as "structure" coverage in our aggregate databases. A pie chart of the coverage distribution is provided in Figure 1.

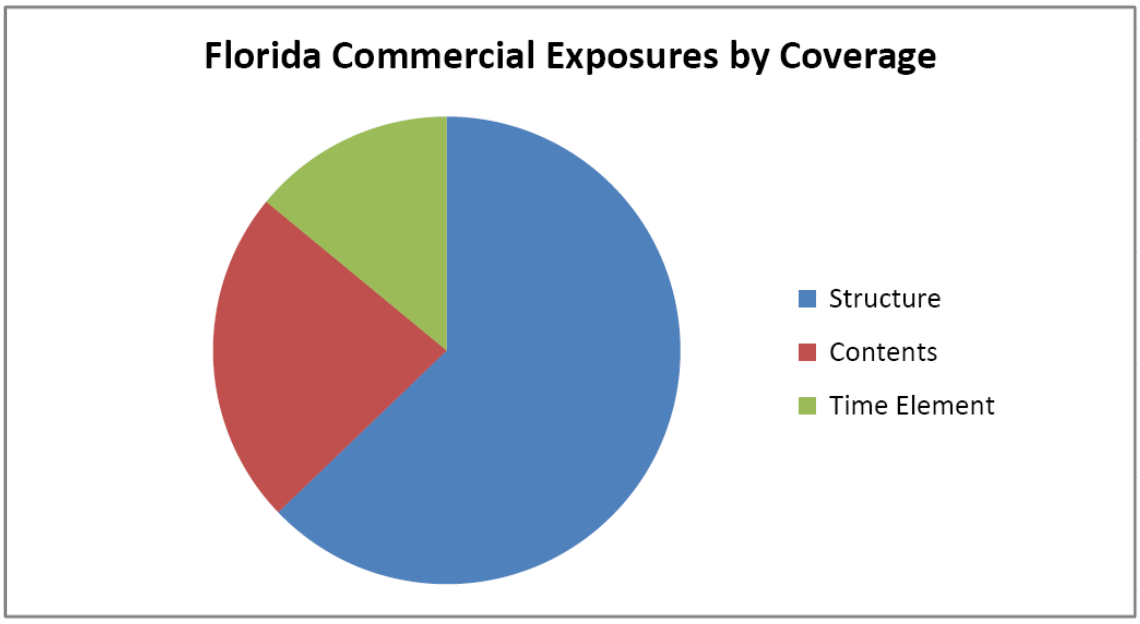


Figure 1

We easily see that the most exposed counties are also the main population centers: Miami-Dade (15.0%) and Broward (11.1%) each contain over 10% of statewide exposure. Orange, Palm Beach, Hillsborough, and Pinellas each contribute more than 5%. Duval, Lee, Brevard, Sarasota, Volusia, Escambia, Seminole, and Polk each contribute more than 2%. This information is better viewed in map form in Figure 2 and Figure 3, which color-code each county's dollar and percentage contribution to statewide exposures.

Distribution of Replacement Values by County

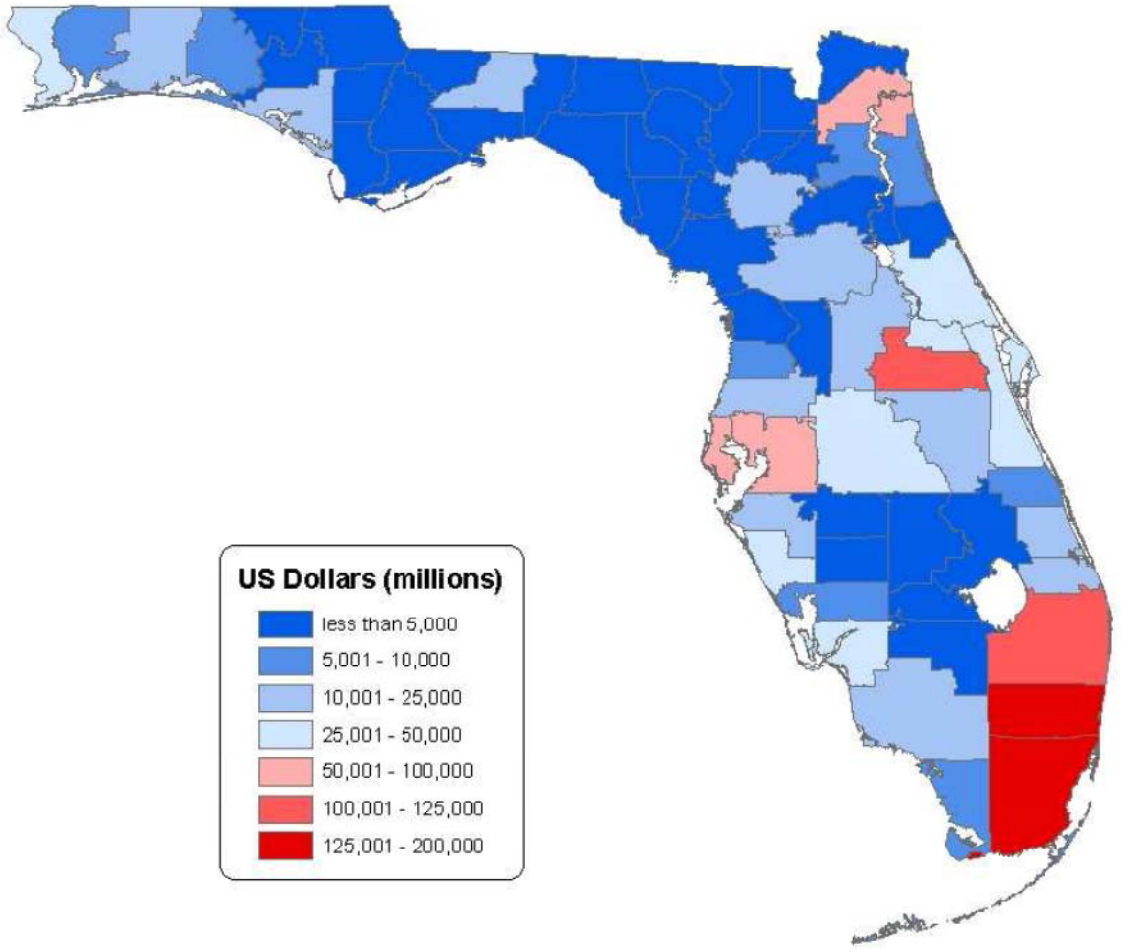


Figure 2

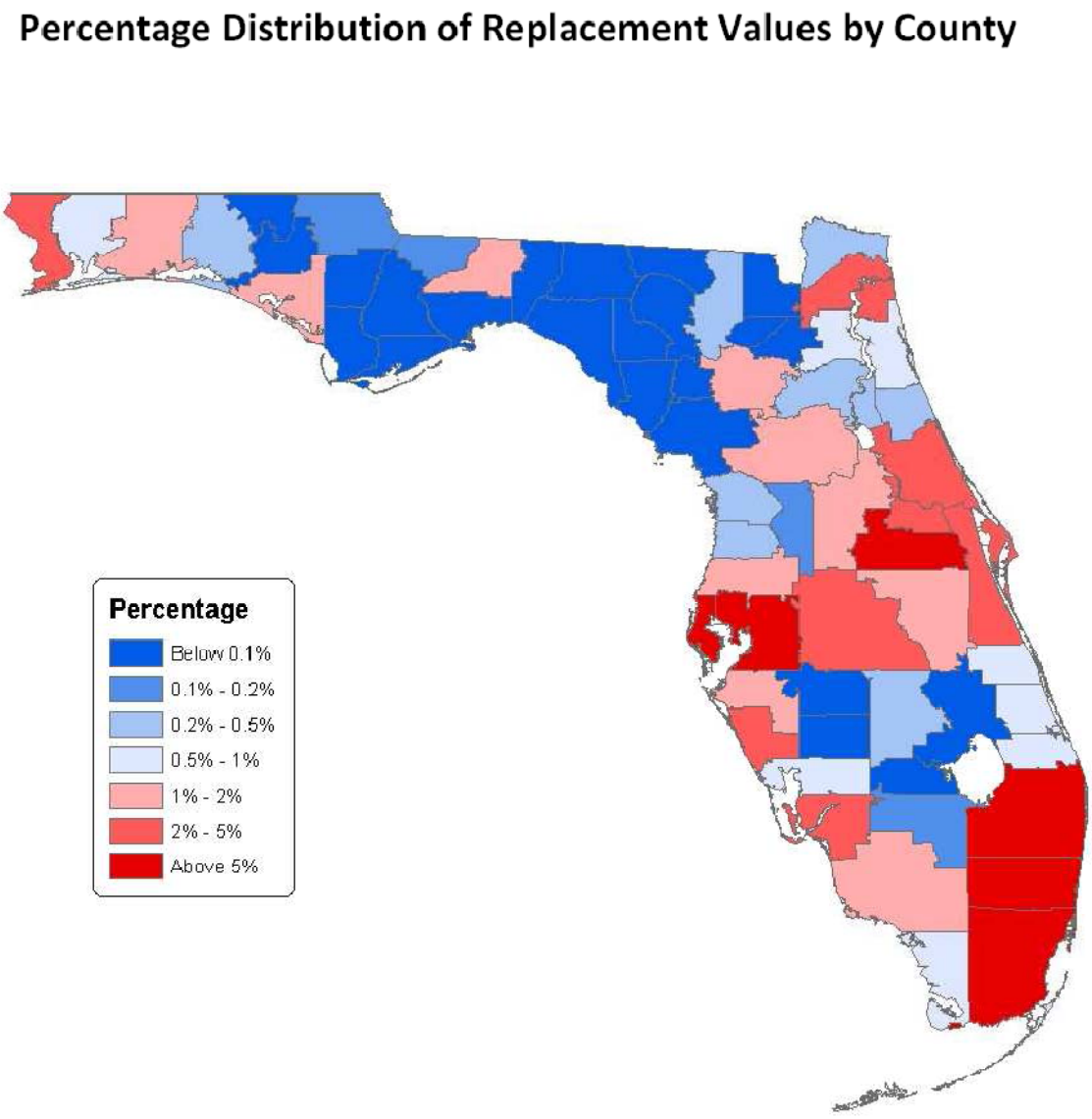


Figure 3

Distribution of Structure Value in Key Counties by Construction and Occupancy Types

Exhibit 3 targets the most exposed counties around the state for a further breakdown of exposures by the construction and occupancy type categories used by AIR in catastrophe modeling. Building codes, practices, and history vary around the state, as well as the makeup of each region's economy. These sheets, one for each of 15 counties, show more detail about the type of risk faced by each significant metropolitan area.

Various types of steel frame construction are by far the most prevalent, comprising about 50-60% of exposure in most key counties. Steel frame is generally less vulnerable to wind loads than

most alternatives, particularly those used in smaller and residential structures. Various concrete and masonry types are second most prominent, comprising 35-40% in most key counties, and usually split about equally between reinforced and unreinforced subtypes. Masonry has generally moderate vulnerability to wind loads.

The most vulnerable types of structures are those made of wood frame and light metal. Wood frame makes up 2-8% of exposure value in the key counties, with a generally smaller proportion in South Florida and larger proportion in the Panhandle. Light metal structures comprise 2-7% of the exposure in key counties, with no clear pattern by region. These structures are often concentrated in certain occupancy types, such as gasoline stations. A general summary of AIR's views on relative vulnerability by construction type is shown in Figure 4 below.

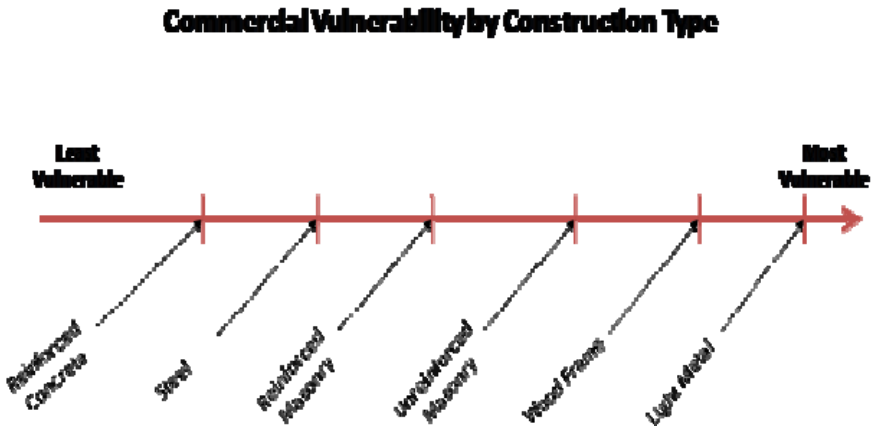


Figure 4

AIR also classifies commercial risks for purposes of vulnerability assessment by occupancy code. The term "occupancy" is used loosely to describe the purpose of the structure. For example, retail, government, agricultural, and infrastructure exposures are separated using this code. The most common occupancy codes around the state are retail trade, personal and business services, and general commercial (a catch-all category for undifferentiated exposures). Each of these typically represents more than 10% of each county's exposures. Government services make up a consistent and substantial portion of each county's exposures (5-9%). However, some areas also show concentrations of over 10% in other categories, such as:

- Temporary lodging - Orange, Volusia, and Collier;
- University/college - Leon (home of Florida State University);
- Health care services – Sarasota, Escambia.

Implications

The results lead to several general observations:

- Of Florida's $1.3 trillion in commercial exposures, the most populated counties are also those most concentrated with respect to catastrophe risk. Roughly one third of exposures are in the southeast tri-county area, with the Tampa Bay and Orlando areas contributing more than 10% each. Fifteen counties in total each contribute more than 2%. It is reasonable to think of commercial hurricane exposures as roughly in line with population.
- Though structures represent the bulk of the exposure, contents and time element (e.g. non-structural) exposures represent nearly one third of the insurable exposure to hurricanes and should not be ignored in planning.
- The majority of Florida commercial structures in the key counties are of relatively low vulnerability construction types such as steel frame and reinforced concrete. Many others are of various masonry subtypes. However, the 5-15% of structures of highly vulnerable types, such as wood frame and light metal, will generate much of the hurricane losses.
- The occupancy type distribution of commercial risks in key counties is fairly consistent around the state, with retail trade and general services dominating. However, pockets of unusual types, such as health care services and universities, can influence the overall distribution for several of the key counties.

Hazard Profile: Current Hurricane Wind and Storm Surge Risk for Florida's Stock of Commercial Structures

AIR's Hurricane Model

Rationale for Modeling Catastrophic Events

Natural catastrophes such as hurricanes have tremendous impacts on society in many ways, from the immediate loss of life and property to far-reaching and long-lasting impacts on the economy and insurance system.

Fortunately, large loss events are relatively infrequent. Unfortunately, they are also severe in impact, and unpredictable, not occurring on regular schedules. It is the combination of these three characteristics that make the estimation of damage and insurance losses from future catastrophes so difficult. The scarcity of historical loss data makes standard economic and actuarial techniques of loss estimation inappropriate for catastrophe losses. Further, the relevance of the loss data that does exist is limited because of the constantly changing landscape of properties. Property values change, sometimes rapidly, along with the costs of repair and replacement. Building materials and designs change, and new structures may be more or less vulnerable to wind loads than were the old ones. New properties continue to be built in areas of high hazard. Finally, it is difficult to understand how losses emerge and should be financed over long periods of time, because storms can strike in any year.

AIR developed catastrophe modeling technologies as alternatives to the actuarial and "rule of thumb" approaches that had previously been relied upon for estimation of potential catastrophe losses. The technical expertise of meteorologists, other physical scientists, engineers, statisticians, actuaries, and computer technology specialists is augmented by the years of experience that AIR has accumulated in this field and integrated into a system for modeling the impact of events. The result is the delivery of reliable and credible loss estimates needed to make informed risk management decisions.

Basic Model Architecture

AIR developed the first commercial software application for catastrophe modeling based on sophisticated stochastic simulation procedures and powerful computer models of how natural catastrophes behave and act upon the man-made environment. The years since have seen the models undergo a continual process of review, refinement, enhancement, and validation. The ongoing research ensures that the models incorporate the latest advances in the scientific, engineering, mathematical and other fields that are pertinent to their development.

Figure 5 below illustrates the component parts of the AIR state-of-the art catastrophe models. It is important to recognize that each component, or module, represents both the analytical work of the research scientists and engineers who are responsible for its design and the complex computer programs that run the simulations.

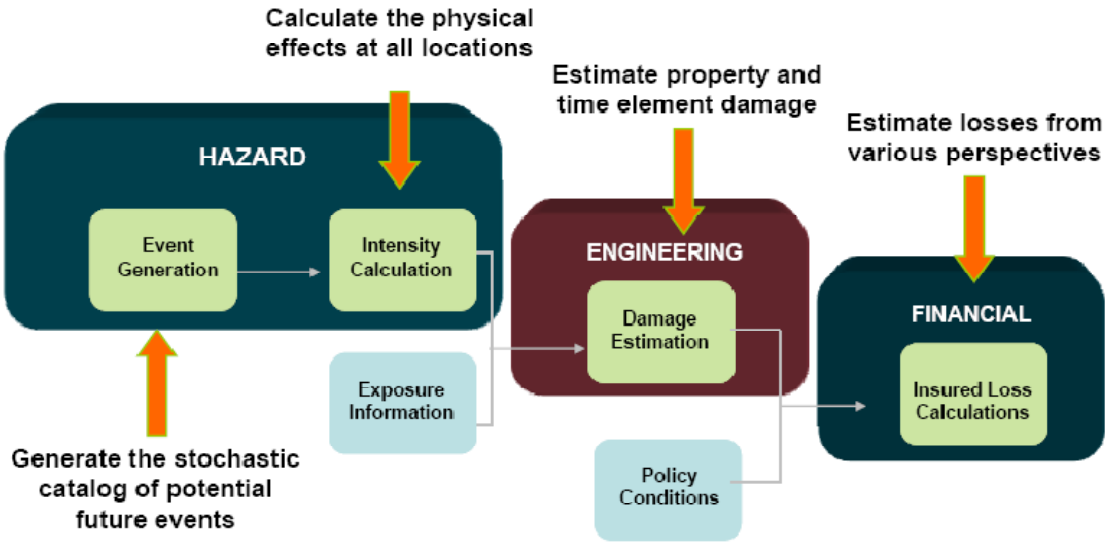


Figure 5: Basic Catastrophe Model Architecture

Hazard: Hurricane Simulation

The event generation module determines the frequency, overall intensity, and other characteristics of potential hurricanes by geographical area. This requires a thorough analysis of the characteristics of historical events. Event generation begins by collecting the available scientific data pertaining to these parameters from many different sources. The data are cleaned and verified. When data from different sources conflict, a detailed analysis and the use of expert judgment is required before they are suitable for modeling purposes.

After rigorous data analysis, AIR researchers develop probability distributions for each of the parameters, testing them for goodness-of-fit and robustness.

Figure 6 shows the major parameters of a simulated hurricane. The selection and subsequent refinement of these distributions are based not only on the expert application of statistical techniques, but also on well-established scientific principles and an understanding of how hurricanes behave.

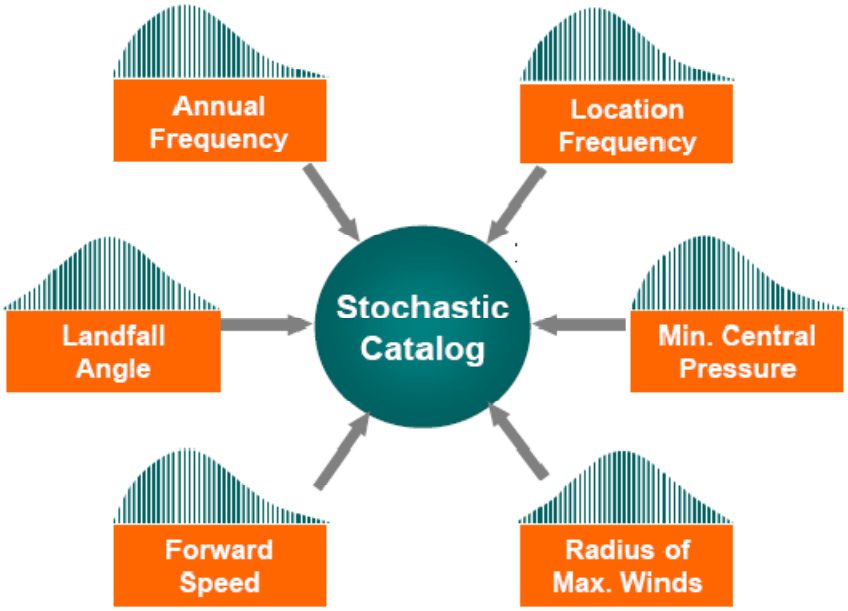


Figure 6: Major Parameters of a Simulated Hurricane

These probability distributions are then used to produce a large catalog of simulated storms. By sampling from these distributions, the model generates simulated "years" of activity. A simulated year represents a hypothetical year of catastrophe experience, but one that realistically could happen in the current year. AIR allows for the possibility of multiple events occurring within a single year. That is, each simulated year may have zero, one, or multiple events, just as might be observed in an actual year such as 2006 (zero landfalling storms) or 2004 (many landfalling storms). Many thousands of these years are generated to produce a complete and stable range of potential annual experience of hurricane activity, and to ensure full coverage of extreme (or "tail") events, as well as full spatial coverage.

Hazard: Local Intensity

Once the model generates the characteristics of a simulated storm, it propagates the event across the affected area. For each location within the affected area, local intensity – a function of a variety of local conditions -- is estimated. Hurricane local wind speed estimates call upon high resolution databases of surface terrain and land cover characteristics. Using this data, AIR calculates a surface friction coefficient to obtain an estimate of surface roughness, which influences how quickly wind speeds dissipate over land. Researchers base local intensity formulae on empirical observation as well as on theoretical relationships between the variables. An example of the results – a "footprint" of maximum wind speeds at each affected location – is shown in Figure 7.

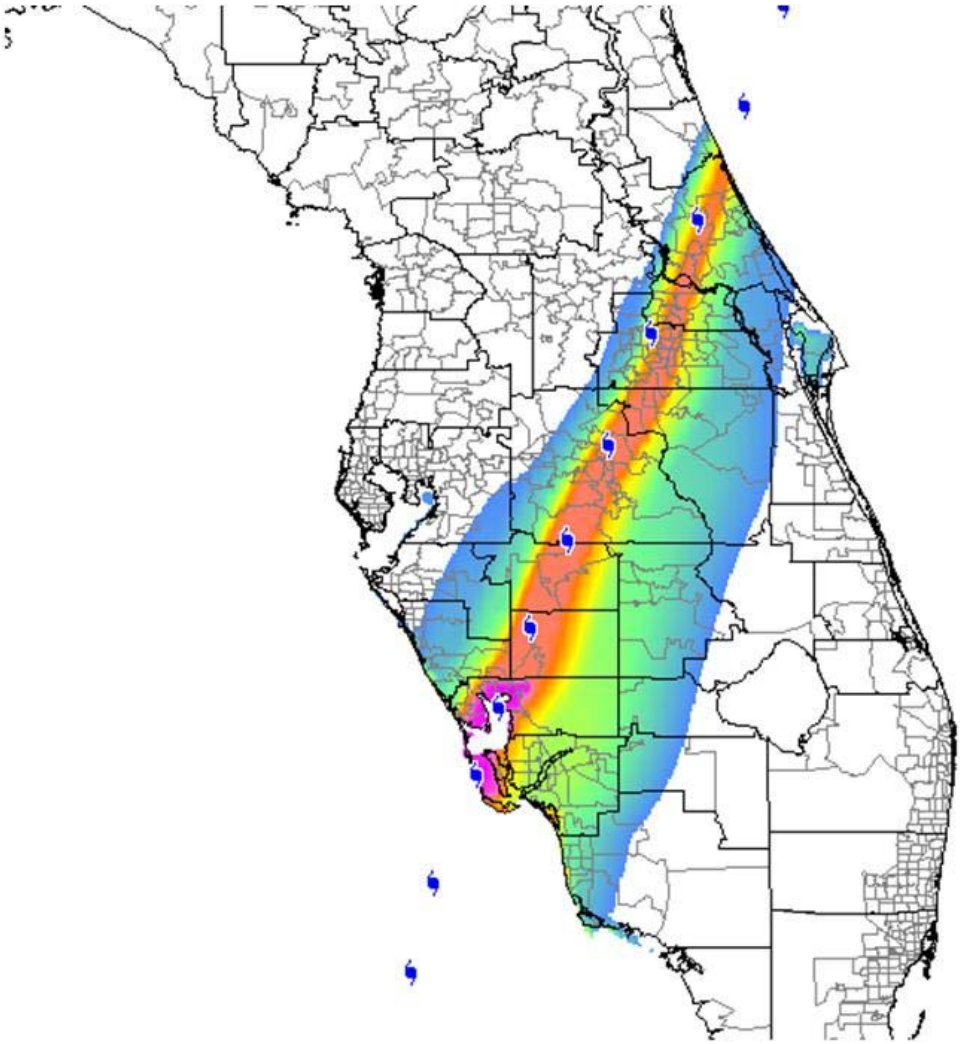


Figure 7: Modeled Wind Footprint for Hurricane Charley

Vulnerability: Damage Functions

AIR scientists and engineers have developed mathematical relationships called damage functions, which describe the interaction between buildings - structural and nonstructural components as well as their contents - and the local intensity to which they are exposed. Damage functions have also been developed for estimating time element losses. These functions relate the mean (average) damage level, as well as the variability of damage, to the wind speed profile at each location. Because different structural types will experience different degrees of damage, the functions vary according to construction type and occupancy, with further modifiers in Florida for "year built" to reflect significant changes in building codes. As illustrated in Figure 8, the AIR model estimates a complete distribution around the mean level of damage – allowing for the possibility of zero damage and 100% or "total loss" damage - for each local intensity and each structural type.

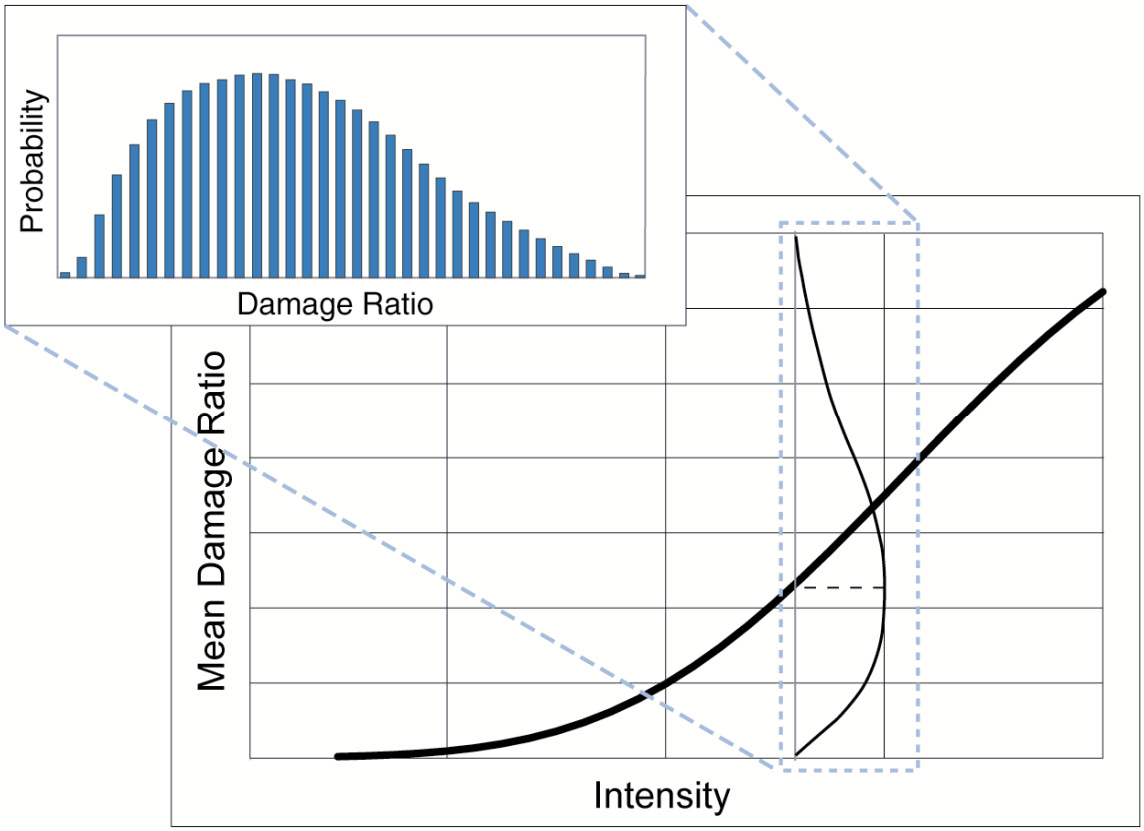


Figure 8: Representative Residential Damage Function

Losses are calculated by applying the appropriate damage function to the replacement value of the insured property. This fact has an important implication, which is that modeled losses are only as good as the replacement values which underpin them. If replacement values are understated by 50%, the modeled losses will be as well. This is why using exposure data of the highest possible quality and completeness is critical to obtaining the most reliable model results.

The vulnerability relationships incorporate the results of well-documented engineering studies, tests, and structural calculations. They also reflect the relative effectiveness and enforcement of local building codes. AIR engineers refine and validate these functions through the use of post-disaster field survey data and through exhaustive analysis of detailed claims data as it becomes available after events.

Financial: Aggregating Losses

Raw damage estimates must be collected for each coverage at each location within each policy, and proper policy terms applied, to yield the insurable losses for the exposure at hand. The final component of the catastrophe model, the financial module, aggregates damage and converts to losses as viewed from whatever perspective is relevant – first-dollar or "ground-up," or paid by an insurance company after deductibles and policy limits "gross" or "net" of reinsurance. Policy conditions may be rather complex, including deductibles by coverage, site-specific or blanket

deductibles, coverage limits and sublimits, loss triggers, coinsurance, attachment points and limits for single or multiple location policies, and risk-specific reinsurance terms. However, in this analysis the main perspectives of interest are ground-up losses and insured losses gross of a standardized industry-wide deductible.

Aggregation of losses while preserving the uncertainty in the simulated damage distribution is not as easy as just adding losses by coverage/location/policy; a statistical technique called "numerical convolution" is applied to each simulated storm loss for each policy/location to get an accurate representation of the total loss, including the variability of the total loss around its average value. The technique is illustrated in Figure 9 below.

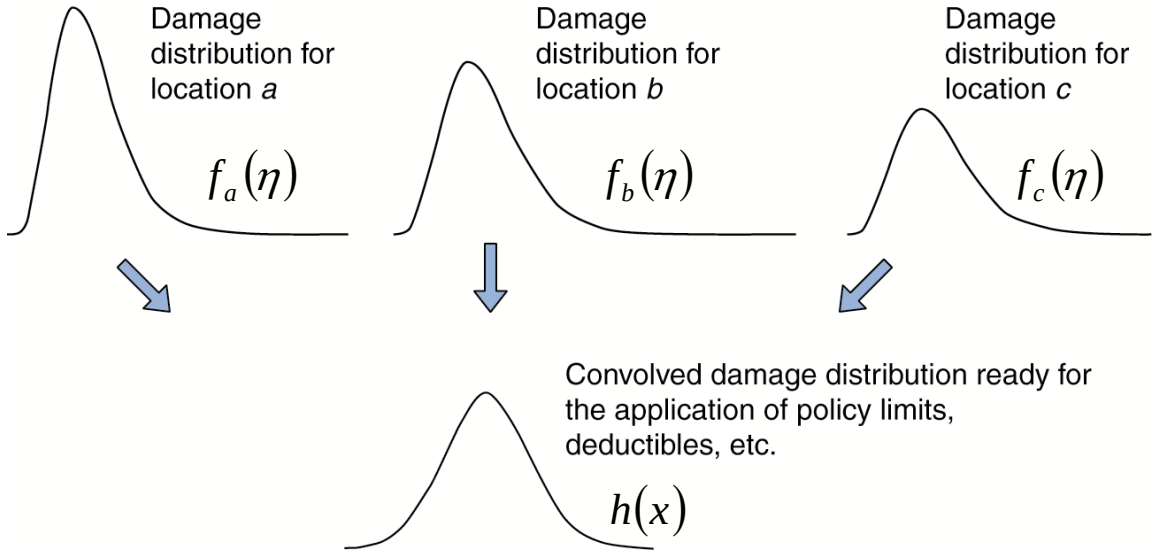


Figure 9: Damage Distribution Convolution Logic

The analytical solution obtained is the most theoretically sound and yields the most precise results.

Interpreting Model Output

The results of simulating the entire catalog against the exposure at hand are condensed into outputs of use to risk managers. The fundamental result is the complete probability distribution of losses, also known as "exceedance probability" (EP) curves. EP curves can be assembled on two bases: occurrence" (largest event in each simulated year) or "annual aggregate" (sum of all losses in each simulated year). They can also be viewed from the ground-up, gross, or net loss perspective.

The probabilities can also be expressed as "return periods." Sometimes this is more intuitive. That is, the loss associated with a return period of 20 years is likely to be exceeded in only 5 percent of years, or on average, in one year out of twenty. Figure 10 below illustrates a sample (not applicable to this analysis) EP curve. Each potential loss amount (on the horizontal axis) can

be paired with the probability that occurrence or annual losses meet or exceed that amount (on the vertical axis).

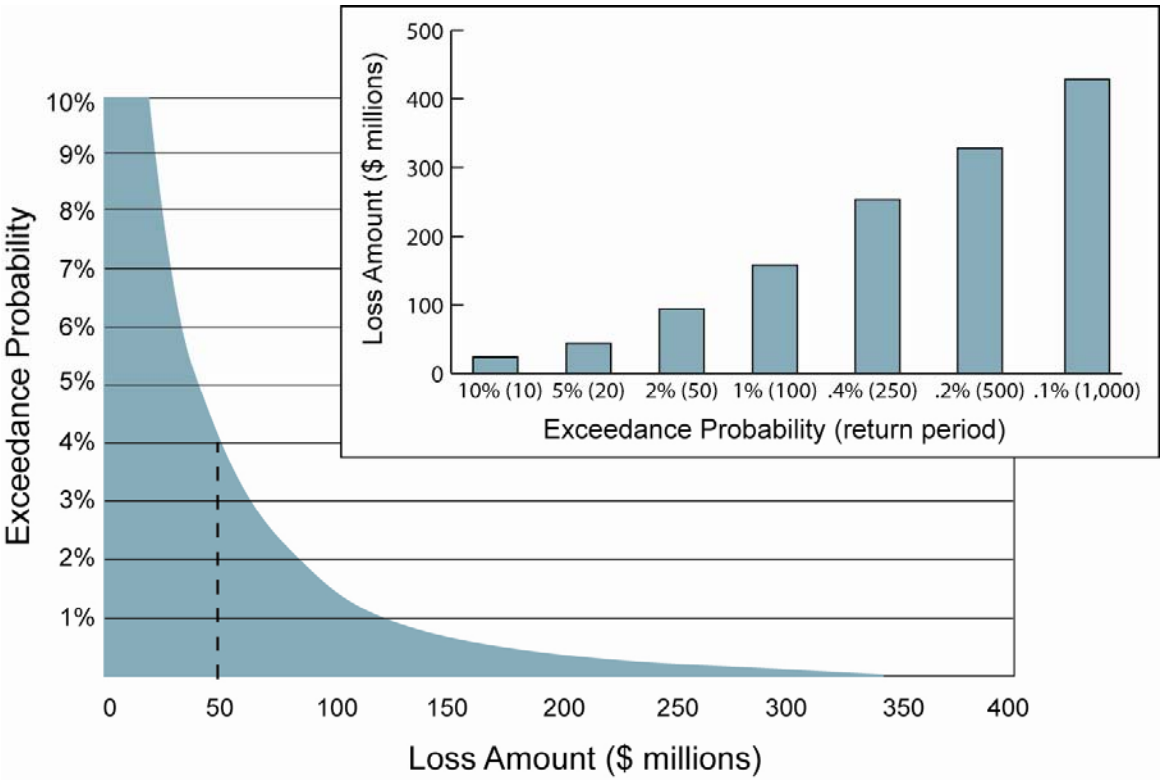


Figure 10: Sample Exceedance Probability Curve

Output may be customized to any desired degree of geographical resolution down to location level, as well as by line of business, construction class, coverage, and other factors. The model also provides summary reports of exposures, comparisons of exposures and losses by geographical area, and detailed information on potential large losses caused by extreme "tail" events.

Scientific Basis of Hurricane Wind Model

Hurricane wind and hurricane storm surge footprints and damage are separately calculated from the same simulated events in the AIR model. This enables a separate look at the losses due to the two perils associated with a hurricane. We analyzed wind and storm surge separately using the same data and analysis options to produce the results in Exhibits 4 to 10.

The wind profile of a hurricane over space, the area affected by the footprint, and time, the duration of damaging winds at each location, is developed using the following simulated parameters for each storm:

1. **Frequency of occurrence**: number of storms affecting each area of the coastline in a season;

2. **Landfall location**: number of landfalls affecting each "coastal segment" of 50 nautical miles;
3. **Heading at landfall**: compass direction of movement of the storm center at landfall;
4. **Minimum central barometric pressure**: intensity of storm at landfall;
5. **Radius of maximum winds**: distance from center of storm to the eye wall;
6. **Forward speed**: velocity of the storm center at landfall.

Once the model has these meteorological characteristics, it simulates the storm's movement along its track. Calculations of local intensity take into account the effects of the asymmetric nature of the hurricane windfield, storm filling over land, surface friction, and relative wind speed profiles. The generation of local windfields is a complex procedure requiring the use of many variables. First, the maximum over-water wind speed is calculated. Adjustments are then made for asymmetry effects, filling, surface friction, and relative wind speeds as a function of distance from the eye.

In the Northern Hemisphere, hurricane winds rotate in a counter-clockwise direction. The combined effects of hurricane winds and forward motion will produce higher wind speeds on the right-hand side of the storm. The model accounts for the dynamic interaction of translational and rotational speeds, and the inflow angle. The effect is visualized in Figure 11 below.

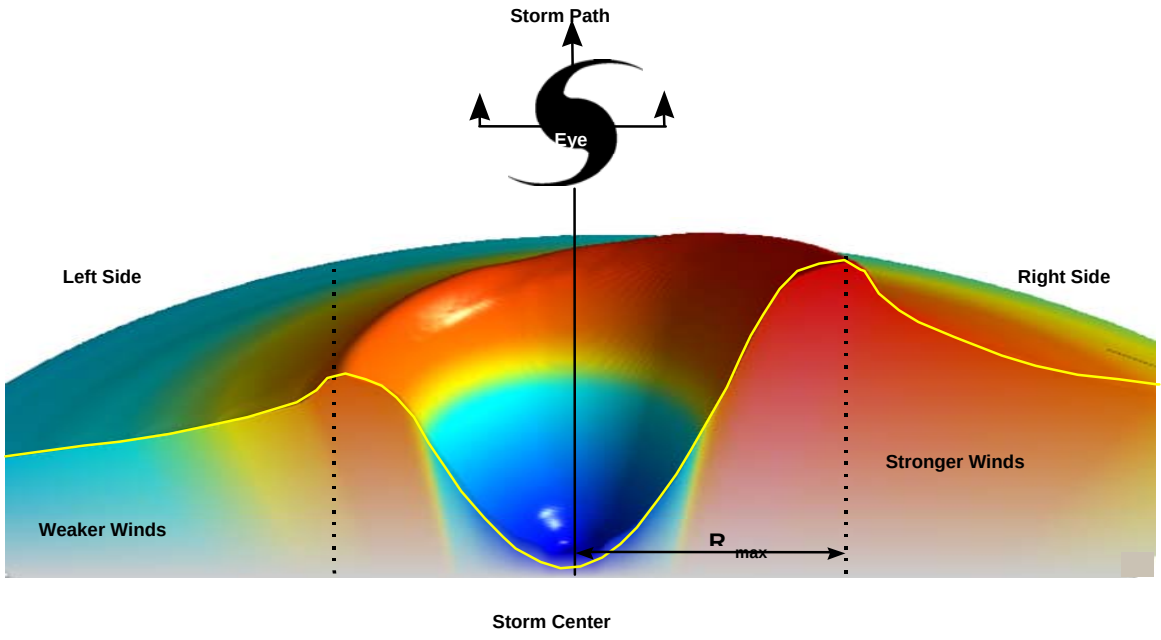


Figure 11: Windfield Cross Section

As the storm moves inland, its intensity begins to dissipate. Central pressure rises and the eye of the hurricane begins to "fill" as it moves away from its energy source, warm ocean water. The

model's filling equations are functions of the geographic location (particularly distance from coastline), and time elapsed since landfall. Rates of fill also vary by region, as is consistent with historical observation.

Differences in surface terrain also affect wind speeds. Wind velocity profiles typically show higher wind speeds at higher elevations, as depicted in Figure 12 below. Winds travel more slowly at ground level because of surface friction. In the AIR model, the initial step in calculating the friction coefficient for each point of interest is to obtain an estimate of the surface roughness at the site. At ground level, horizontal drag forces induced by the surface roughness are exerted on the wind flow, causing retardation of the wind near the ground. The surface roughness is estimated based on high-resolution digital USGS land use/land cover data. The land use/land cover categories vary from urban or built-up land, to agricultural land, to forest land or wetlands, to water. Each terrain type has a different "roughness value" that will lead to different frictional effects on wind speeds. In general, the rougher the terrain the larger the frictional effect on wind speeds. The magnitudes of the friction coefficients in the AIR method are consistent with accepted scientific literature and empirical hurricane wind speed data.

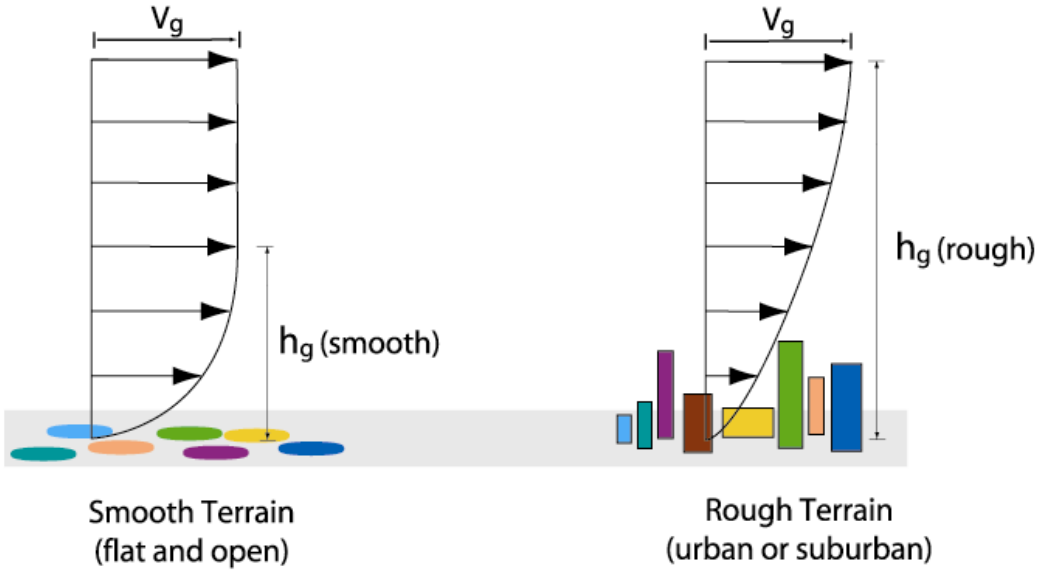


Figure 12: Terrain Effects on Wind Speed Profiles

Finally, the wind speed at any particular location is dependent on the radial distance between the eye of the storm and the location of interest. Figure 13 illustrates a range of relative wind speed profiles for different radii of maximum winds. Note that the ratio of the velocity at location *x* to the maximum velocity equals 1 at the radius of maximum winds and then drops off as distance from the eye increases.

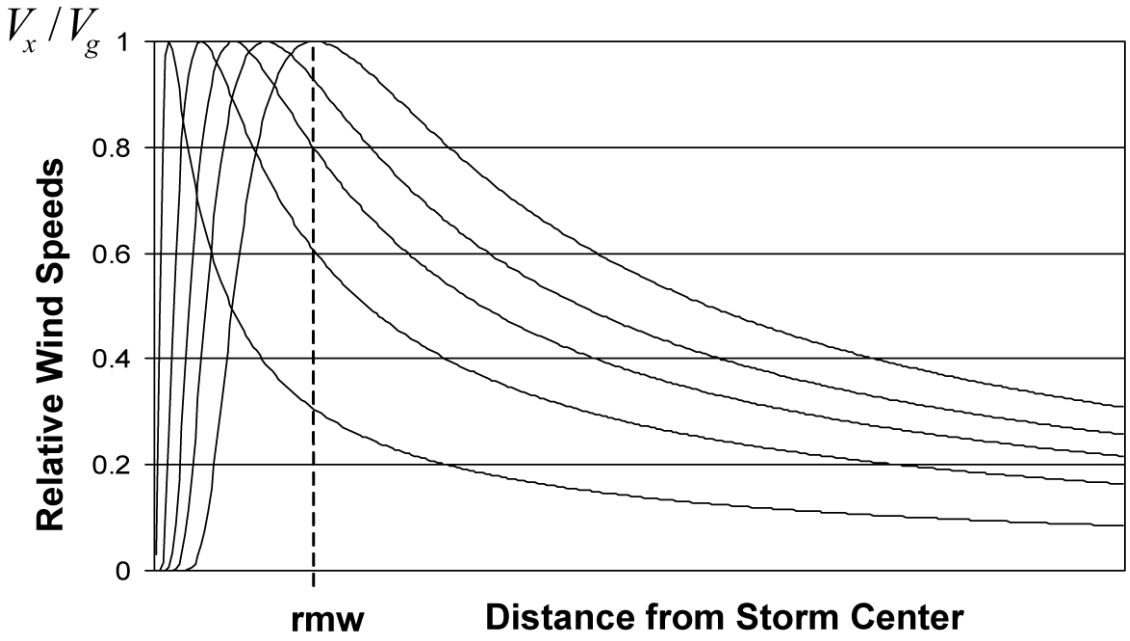


Figure 13: Relative Wind Profiles

AIR researchers validate windfield calculations by comparing the recorded wind speeds of historical storms to those generated by the model.

Scientific Basis of Storm Surge Model

Storm surge is the water forced ashore by a hurricane. Virtually every hurricane is accompanied by a surge of some magnitude. AIR's storm surge model is a fully probabilistic component of the hurricane model. It is calibrated using historical observation data and output from NOAA's SLOSH (Sea, Lake, and Overland Surges from Hurricanes) model. AIR's model does not consider flooding that occurs from the heavy rains that typically accompany a hurricane, nor flooding from dam and levee failures (such as the New Orleans city flooding from Hurricane Katrina).

Surge modeling is based on the key meteorological parameters of simulated hurricanes, such as central barometric pressure, radius of maximum winds and forward speed. In addition, it incorporates detailed databases of coastal elevation, orientation, tide height, and bathymetry.

Forward Speed and Track Angle at Landfall

Storm surge is caused not only by low barometric pressure in the eye of the storm, but also by winds pushing the ocean's surface ahead of the storm. Friction of ocean water with the ocean floor inhibits the water from moving around and out of the way of the oncoming winds. Water begins to pile up in a dome on the right side of the storm track. The faster the forward speed of the storm, the more pronounced this effect will be.

Storm surge forms primarily on the right side of the storm track because the counterclockwise circulation of the hurricane and the steering winds that determine the storm's forward speed are moving in the same direction. Thus hurricanes that make landfall perpendicular to the coastline ("coast-normal") cause greater levels of surge than hurricanes making landfall at more oblique angles or "skirting" along the coast.

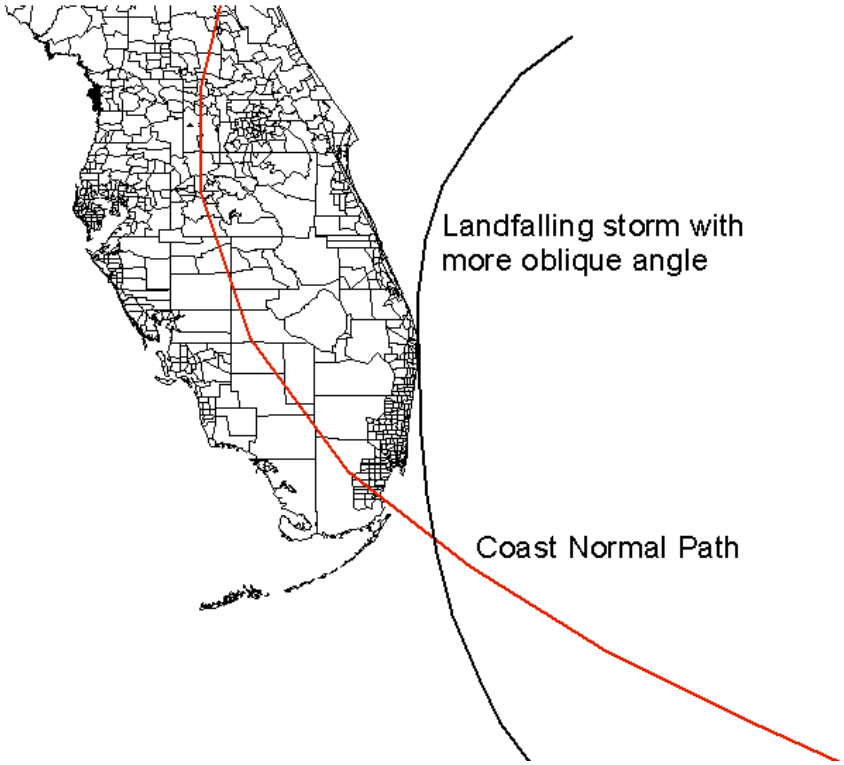


Figure 14: Storm Surge Variations by Hurricane Track

Bathymetry (Water Depth)

Another factor that significantly affects the potential for destructive storm surge is the angle of the continental shelf. The shallower the angle, the easier it is for significant storm surge to arise. Friction with the ocean floor increases and the level of storm tide increases correspondingly. Probabilistic storm surge simulation in the AIR model incorporates an extensive bathymetry database.

Tide Height

The higher the tide, the greater the sea-level elevation. This is the reason why some "minor" hurricanes have been associated with high levels of surge.

Overland Elevation and Distance to Coast

The total depth of inundation at any location is the difference between the peak surge, defined as the sum of tide and storm surge, and the ground elevation at the location of interest. In addition, the surge loses momentum as it travels over land. Steeper slopes lead to more rapid "attenuation" (loss of momentum), as does rougher terrain. The model also applies a factor for distance to coast from any given location.

Damage Calculations for Hurricane Wind and Surge

AIR engineers have developed wind damage functions to provide detailed breakdowns of loss estimates by coverage, construction class, and occupancy. Six major occupancy classes (Homeowners, Apartments/Condos, Commercial, Industrial and Autos) are further broken down into distinct construction classes. These include wood frame, unreinforced masonry, reinforced masonry, reinforced concrete, steel frame, light metal and mobile homes.

The vulnerability functions have been developed by experts in wind and structural engineering and are based on published engineering research and engineering analyses. The functions have been validated based on results of damage surveys and actual claims data provided by client companies. The development of commercial damage functions presents a somewhat greater challenge than the development of residential functions. This is due primarily to the relative scarcity of detailed loss data with which the relationships are fine-tuned and validated. Commercial structures are, on average, less vulnerable to wind damage, so the absolute amount of industry loss data is smaller to begin with. Further, for multi-location policies, losses paid centrally to a corporate headquarters often do not include information about the actual damaged property.

Component-Based Approach for Commercial Structures

AIR wind engineers have developed a component-based engineering approach for the development of commercial damage functions. The resulting functions have been validated by external experts from leading wind engineering institutions.

Figure 15 shows a schematic of AIR's component-based engineering approach for the development of commercial damage functions. Several building components and attributes that affect building vulnerability to hurricane winds are considered. These can be divided into three broad categories: a) the primary attributes that deal with the occupancy, material and the height of the building; b) secondary attributes that define the building envelope, such as roof, cladding material, and size of openings; c) other attributes, including amount of engineering attention, wind hazard and repair cost, which affect building vulnerability indirectly. The relative impact on vulnerability of each component or attribute is obtained from a variety of sources, including experience gained from post-event reconnaissance and input from wind engineering experts.

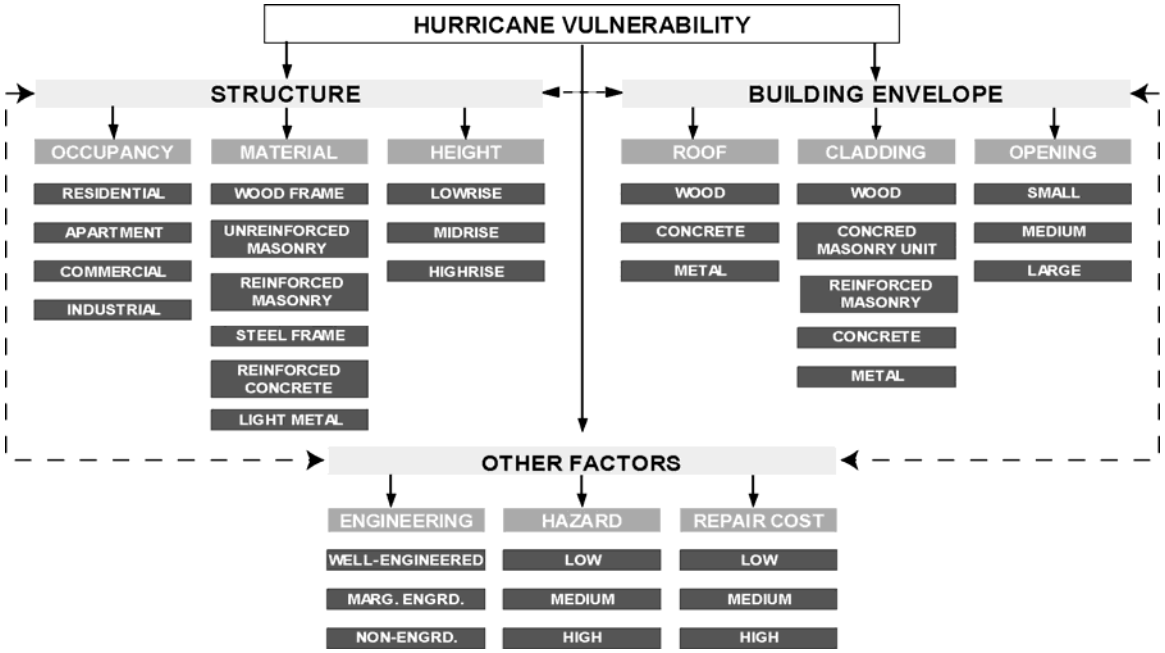


Figure 15: Component-based Vulnerability Model for Commercial Structures

AIR damage functions for commercial and apartment/condominium buildings explicitly account for building height. Separate damage functions have been developed for various height ranges: 1 to 3 stories, 4 to 7 stories, and more than 7 stories. We know from wind speed profiles that wind speeds increase with height. For a given storm at a given location, a low-rise building may experience Category 1 wind speeds, while the upper floors of a 20-story building may experience winds corresponding to a Category 5 hurricane. This is illustrated in Figure 16 below. On the other hand, while the wind hazard increases with height, vulnerability typically decreases. High-rise buildings are less vulnerable since they are generally well-engineered, built to strict building code requirements and, unlike residential structures that typically have gabled or hip wood frame roofs, have wind-resistant flat slab roofs.

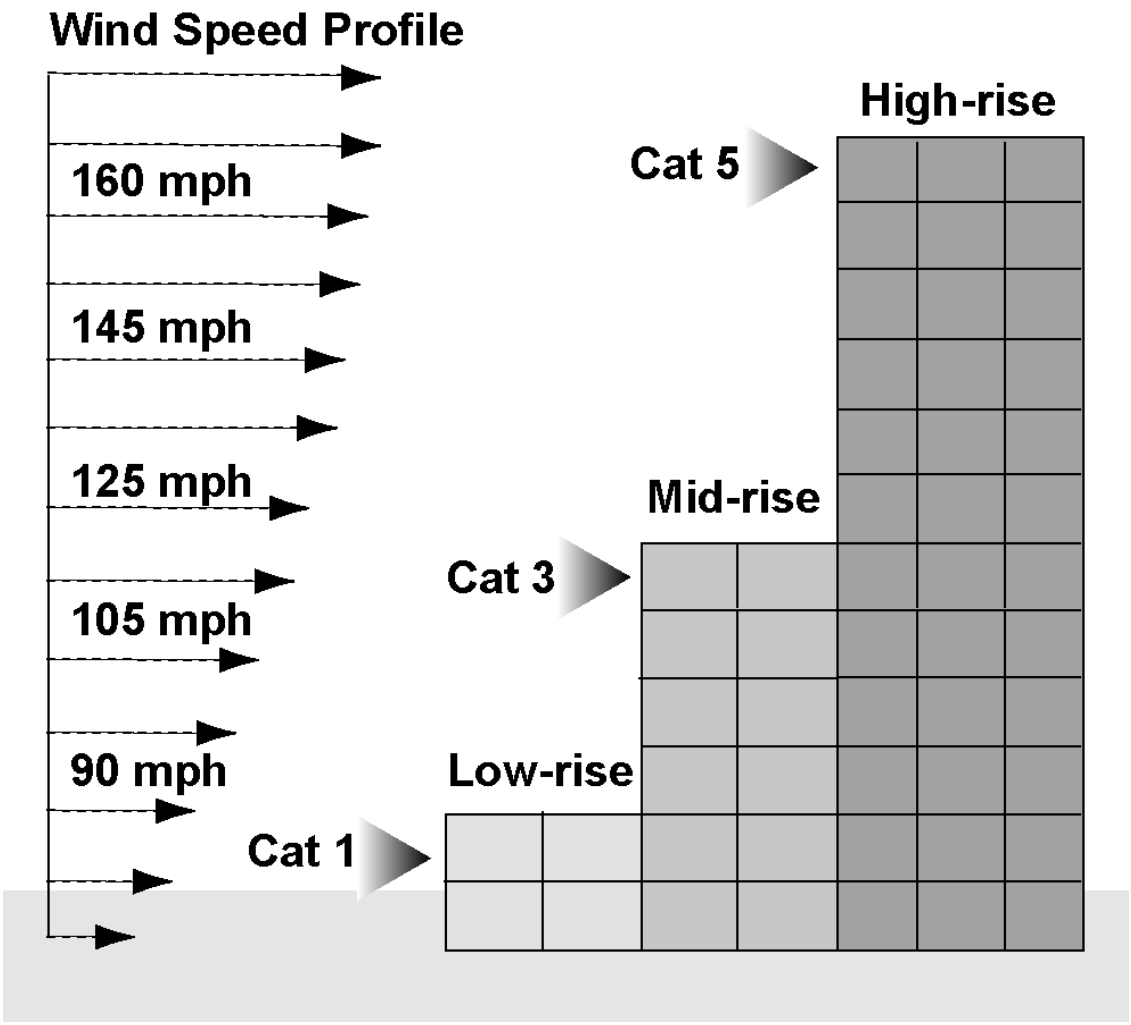


Figure 16: Variation in Wind Hazard by Height

Apartments and condominiums usually receive a similar degree of engineering attention that of commercial construction. From a structural viewpoint, commercial construction and apartments/condominiums are quite similar. Nevertheless, apartments and condominiums have some building components that make them more susceptible to windstorms than commercial construction, such as balconies, awnings, and double sliding glass doors. These components are less engineered at the design and construction stages and hence lead to greater vulnerability as compared to commercial construction.

The model provides the option to evaluate the impact of many individual risk characteristics of a building's components, each of which can enhance or reduce vulnerability to wind damage. These may include roof geometry and pitch, roof covering, window protection and glass area, exterior doors, and other features.

Damage Functions at the Coverage Level

Separate damage functions for each of building, contents, and time element coverages provide not only estimates of the mean, or expected, damage ratio corresponding to each wind speed but, in addition, construct probability distributions around each mean (recall Figure 8 above). This way, the model ensures non-zero probabilities of zero and total (100%) loss, reflecting the wide variation in observed damage at adjacent locations experiencing the same local intensity in a storm.

In the case of building damageability, the damage ratio is the dollar loss to the building divided by the corresponding replacement value of the building. The contents damage ratio is the dollar loss to the contents divided by the replacement value of the contents. Contents damageability is a function not only of building type, but also of occupancy class. That is, for each occupancy class, there exists a contents damage function, which itself is a function of the building damage ratio. Occupancy provides information on the likely contents present and hence their potential vulnerability.

In the case of time element, the damage ratio represents per diem expenses or business interruption losses associated with the expected number of days that the building is uninhabitable (residential) or unusable (commercial). Time element damageability is a function of the mean building damage, as well as the time it takes to repair or reconstruct the damaged building. The functional relationship between building damage and loss of use is established using detailed published building construction and restoration data and on engineering judgment. Estimated time element losses have been validated using actual time element loss data from client companies.

Modeling Damage due to Wind Duration

The AIR tropical cyclone damage estimation module develops a complete time profile of wind speeds for each location affected by the storm, thus capturing the effects of wind duration on structures as well as the effect of peak wind speed.

Design loads are routinely exceeded in tropical cyclones of even moderate intensity. With no reserve strength, a fastener or connector that has been pulled out or pulled through as a result of uplift load can compromise the integrity of the building envelope. Wind damage manifests at the weak links in a structural system. As each connector is overwhelmed, loads are transferred to the next point of vulnerability. The longer the duration of high winds, the longer this process continues and the greater the resulting damage.

The cumulative effects of winds can be examined using a dynamic approach. In order to estimate damage to a property at any point in time, it is important to take into account the extent of the damage that has occurred in the preceding period. Each damage ratio is applied in succession to the remaining undamaged portion of the exposure from the preceding period. Figure 17 illustrates this process.

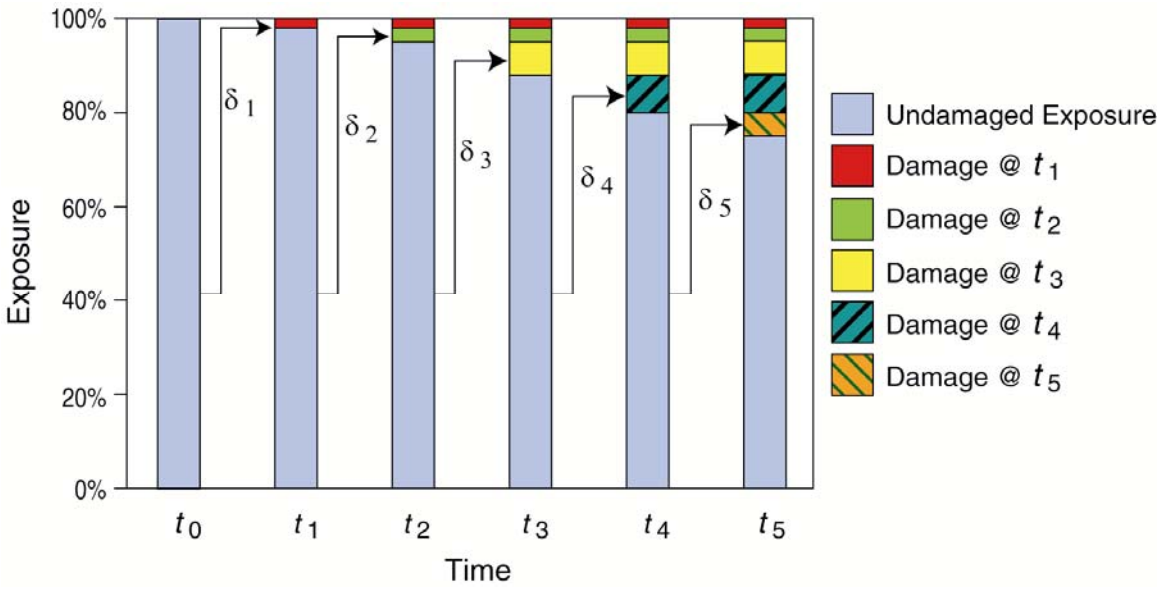


Figure 17: Measuring the Cumulative Effects of Winds

At t_0, before even tropical storm force winds have reached the site, there is zero or negligible damage. At time t_1, with wind speeds near 60 mph, the damage ratio δ_1 is calculated as a percentage of the full replacement value. At t_2, the damage ratio δ_2 is applied to that percentage of the property that was left undamaged in the previous period. This process continues until wind speeds once again fall below tropical storm strength.

Calculating damage only when winds are at their maximum and applying a single damage ratio to the full replacement value would completely miss the cumulative effects of prolonged winds.

Modeling Damage due to Storm Surge

The levels of damage caused by surge are evaluated by construction type for each class of occupancy. Damage is caused by the momentum, or force, of the water pushed onshore, damage due to the water itself, and, at the component level, damage due to the corrosive effects of salt. Observation data available from Federal Emergency Management Agency (FEMA) and the Army Corps of Engineers and AIR's post-disaster surveys was used in the development of the surge damage functions. The height of the surge is the main parameter used in the loss calculation.

Modeling Results: Loss Distributions for Hurricane Wind and Storm Surge

Statewide Hurricane Wind

Exhibit 4 shows average annual losses (AAL) for wind-only damage of over $1.7 billion on an occurrence (largest single storm in year) basis, and over $1.8 billion on an annual aggregate (sum of all storms in year) basis. Though these amounts can be thought of as the average

annual impacts over time, and are particularly useful for exercises like rate-making and estimation of mitigation differentials (the subject of the next section of this study), the risk of severe disasters is better measured by the losses at various exceedance probabilities, sometimes also called Probable Maximum Losses (PMLs).

The 5% EP corresponds to the 20-year PML. This is a loss of just over $8.1 billion for a single storm or $9.0 billion on a season basis. As we read across for more severe scenarios, the 100-year PML is $28.3 billion for a single event and $33.6 billion for a severe season. The most severe scenario analyzed is the 1000-year PML of $86.6 billion (occurrence) and $88.4 billion (aggregate).

The above numbers are on a ground-up (first dollar damage) basis; AIR also estimates "gross insured" losses after an industry average hurricane deductible set at $1,000. It is impossible to know the exact distribution of insurance deductibles for every Florida commercial policy, of course, so this amount is the standard used in statewide analyses. Gross AAL is about $1.6 billion on an occurrence and nearly $1.8 billion on a season aggregate basis, with the PMLs also falling typically 5-10% below their corresponding ground-up damage amounts.

Statewide Storm Surge

The bottom half of Exhibit 4 shows analogous results for the peril of storm surge (only) rather than hurricane wind. On an average annual basis, statewide storm surge is $235 million for a single large event and $244 million in aggregate. This represents about 13-14% of the wind loss amount.

However, in severe PML scenarios, storm surge is a rising proportion of the threat to the state's commercial structures. Beyond the 2% EP level (50-year PML), the proportion accelerates to 16-18% at the 100-year PML (about $5 billion), and over 20% at the 250-year PML (about $10 billion).

Using the gross numbers subtracts about 3-5% of the losses on an average annual basis, and 5-10% of the losses at most of the EP/PML points analyzed.

County Breakdowns of Probable Maximum Losses

Exhibit 5 drills down the severe scenarios to the county level for the 15 counties with the largest exposure as identified in the previous section of this study. Not all of these counties are coastal, and therefore some have negligible modeled losses from storm surge.

At the 0.4% EP (250-year PML), 1% EP (100-year PML), and 5% EP (20-year PML) levels, we find that, as expected, the largest counties by exposure can sustain the largest hurricane wind losses. For example, at the 1% EP level, Miami-Dade ($13.3 billion), Broward ($7.5 billion), and Palm Beach ($5.7 billion) lead the list of county-level potential losses. Note that among counties with similar exposure, coastal counties disproportionately contribute to PMLs – for example, Pinellas and Collier have larger losses than Orange and Hillsborough. Nonetheless, no county in Florida is safe from hurricane wind losses, and the 2004-05 storms clearly demonstrated this in

the form of insurance claims from all 67 counties in the state. Modeled results show that even Orange, Leon and Seminole contribute hundreds of millions in potential 100-year PML losses.

Note also that for analysis purposes, each county's PML was calculated separately – that is, the 100-year loss for a county is based on ranking the losses for only that county among all events in AIR's catalog. Because most simulated storms affect multiple counties, PMLs are not "additive" – the statewide total for a given EP level is not the sum of the losses at that same EP level over all counties. Though this result is counterintuitive, using the PMLs on a county basis allows easy comparisons of the impact of severe scenarios around the state, which outweighs the disadvantages of non-additivity for our purposes.

Storm surge impacts are more closely related to proximity to the coast, as well as the geographical nature of the coastline off each county. Here we see the perhaps surprising result that Southwest Florida is highly prone to storm surge, with Collier ($1.6 billion) and Lee ($1.4 billion) being most impacted at the 100-year PML level and Sarasota ($209 million) and Pinellas ($179 million) also disproportionately impacted relative to wind losses. Miami-Dade faces significant surge potential at over $500 billion, but it rapidly decreases as one moves north along the Southeast Florida coast with Broward and Palm Beach under $200 million. Most other counties are not severely threatened, and some inland counties face no storm surge threat at all (though flooding from rainfall is a significant threat to these counties from most hurricanes, it is not analyzed in this study).

County Breakdowns of Loss Costs for Hurricane Wind and Storm Surge

It is often informative to look at the "loss cost" or average annual losses per unit ($1,000) of exposure, as a way to compare the hurricane threat on a common basis with the exposed replacement value. This is also the core statistic from the models used by insurance actuaries in rate-making. Exhibits 6, 7, and 8 detail the loss costs by county and coverage for every county in Florida breaking down hurricane wind and storm surge separately. Note that some counties not threatened by storm surge do not appear in Exhibit 7.

By far the highest loss costs for hurricane wind appear in Monroe County ($6.78 for structure) – not surprising, since it is subject to both a high frequency of by-passing hurricanes and prone to very intense storms as it is surrounded by typically very warm Gulf waters. It has almost twice the annual risk of the next highest county, Miami-Dade ($3.55). Due to the higher frequency of storms, Southeast and Southwest Florida counties show the highest loss costs, with Broward, Palm Beach, and Collier near $3.00 and Charlotte, Martin, Indian River, and Gulf over $2.00.

On the storm surge side in Exhibit 7, small Gulf county in the Panhandle tops the list at nearly $4.00, but the more populated counties in Southwest Florida (Collier, Lee, Charlotte) stand out as the largest aggregate annual threats for storm surge from hurricanes.

Loss Distributions for Key Counties by Construction and Occupancy Types

Exhibits 9 and 10 provide county-level detail, further broken down by construction and occupancy type, for average annual losses from each of hurricane wind and storm surge separately.

Implications

The results lead to several general observations:

- At over $1.7 billion, the annual expected loss from hurricane wind for Florida's commercial building stock is a significant financial burden. Policymakers should think of this as part of the "budget" or as underlying costs associated with the Florida economy. This can also be viewed as the first building block of the minimum annual insurance premium required to fund the risk.
- Severe scenarios, such as the 20-year season at $9 billion and the 100-year season at over $33 billion, demonstrate that the commercial building stock is vulnerable to hurricane emergencies of a scale which require significant insurance (e.g. billions of dollars in annual premium) to transfer the risk in advance, and possibly significant financing for the remaining risk in the form of additional state debt or federal assistance.
- Storm surge affects largely coastal counties, but nonetheless comprises a non-trivial portion (at 13-15%) of the total hurricane risk, and a disproportionate share of the total risk associated with severe storm and season scenarios (as much as 20%).
- Billions in commercial wind losses can occur even in regional severe scenarios; a 100-year event could produce well over $20 billion in wind losses just in Southeast Florida. However, no county in the state is "safe" from significant losses, as the analysis for even the most inland populated areas shows.
- Storm surge losses in severe scenarios are disproportionately concentrated in Southwest Florida, from Collier to Pinellas. Miami-Dade also faces a significant threat, which rapidly diminishes as one moves up the Gold Coast.
- Annual loss costs reflect the expected frequency of hurricanes as well as their intensity. Therefore, the highest loss costs are in areas prone to frequent hits – Monroe County's loss costs, the core statistic determining insurance rates, are nearly double those for any other county. Southeast Florida counties dominate the wind loss cost analysis, while Southwest Florida counties face higher loss costs for storm surge. Panhandle counties also have significant storm surge loss costs, but the lower frequency of events dampens their wind loss costs relative to the southeastern counties.

Mitigation Analysis: Hurricane Wind Loss Mitigation for Common Commercial Structure Types

AIR's Individual Risk Model (IRM)

Within the vulnerability module of AIR's hurricane model is a specific subsidiary model for individual risk analysis. This is the part of the modeling architecture which operates on what catastrophe modelers call "secondary modifiers," or detailed construction features - those beyond the overall construction type code, year built and height – introduced to the model in a property data record. It may be visualized as a smaller box with the Engineering module in Figure 5 showing basic model architecture.

The IRM was developed using a knowledge-based expert system and a structured approach. Based on structural engineering expertise and building damage observations made in the aftermath of historical hurricanes, more than 30 building features have been identified as having a significant impact on the building losses. The most relevant to the scope of this project are used in the feature analysis in this report.

Options or categories for each feature are identified based on construction practice. Algorithms for modifying the vulnerability functions[3] are developed based on engineering principles and building performance observations. The modification captures the changes to building vulnerability that result when certain features are present and when information on such features is known. The function varies with the wind intensity to reflect the relative effectiveness of a building feature when subjected to different wind speeds.

The first step in the development of the individual risk model is to identify building and environmental characteristics that impact the performance of a building in high winds. These features are selected based on research papers and knowledge of building performance in high wind as obtained in the course of hurricane damage surveys. The AIR model includes four groupings of building and environmental features that influence damageability. These are:

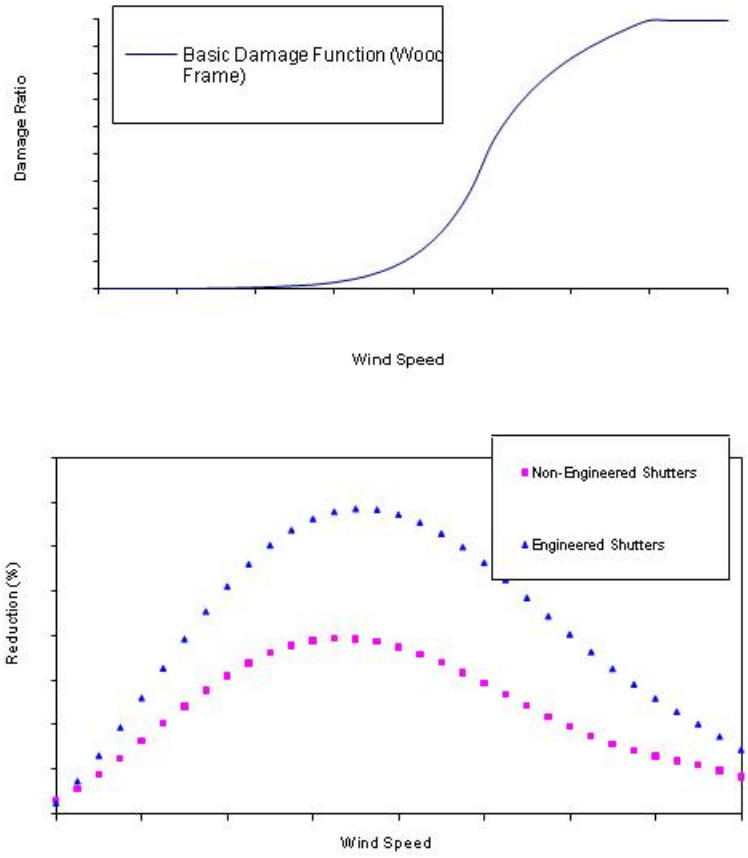
- Nonstructural features, (e.g. cladding)
- Structural features (e.g. roof and wall systems)
- General building features (e.g. building condition, occupancy)
- Environmental features (e.g. tree exposure, surrounding terrain)

Note that the IRM supports any combination of multiple building features on the building damage and produces an integrated modification function to the vulnerability function. In other words, the IRM does not operate in a simple "additive" or "multiplicative" fashion – every combination is different, and that is why the resulting relative loss cost tables below are so complex.

[3] The IRM modifies damage functions for each coverage (structure, contents, time element) separately and distinctly. The effect of a feature on structure damage may not bear a close relationship to its effect on time element damage.

How the IRM Operates on Building Features

Figure 18 illustrates the application of modifications for storm shutters to the basic damage functions for a given AIR construction type code; in this case, wood frame. The basic function assumes a status of "unknown" for the presence of storm shutters. Modifications for non-engineered shutters (e.g. plywood) and engineered shutters (e.g. metal roll-up type) are stored in the IRM. When a data record is introduced to the model with no information about storm shutters, the "unknown" basic damage function for the construction type is used. When a data record containing specific knowledge about storm shutters – engineered present, non-engineered present, or none at all present – is introduced, the damage function is modified according to the IRM. A property known to have no storm shutters will be modeled as slightly more vulnerable than average, raising its relative losses and showing a "lack of mitigation debit," but a property with non-engineered shutters will be modeled as somewhat less vulnerable and show a "mitigation credit" in the relative losses, and of course a property with engineered shutters will show even less vulnerability and a higher "mitigation credit."



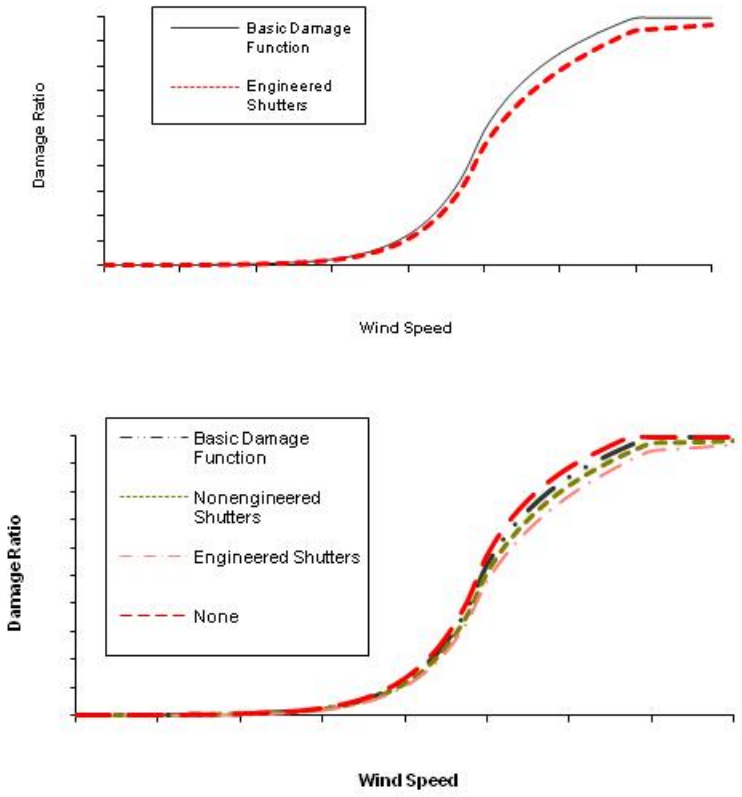


Figure 18: Example of Applying Mitigation Modifiers to Basic Damage Function

Choosing Relevant Features for Mitigation Analysis

The most relevant of the IRM features to the scope at hand have been analyzed in this report. The features are chosen based on the following criteria:

- Effect on relative hurricane wind damage loss costs (average annual losses) to those for a "base" structure in which secondary modifiers are unknown;
- Ability to define the feature and describe it in a finite number of common categories for commercial structures in Florida;
- Ability to recognize the feature category in either a "drive-by" or more detailed property inspection, to report it on typical insurance applications, and to store it in policy exposure data used for catastrophe modeling;
- Practical challenges in the degree of knowledge of construction features of any particular structure.

There is also a complex interaction between the basic construction type and the relevant features for that type. For example, the roof geometry, deck attachment method, and anchorage to walls

are far less relevant for high-rise concrete and steel office buildings with reinforced concrete roof decks than they would be for low-rise commercial-residential buildings.

The final approach reflects a multi-stage mitigation classification architecture and the fundamental guiding principle stated as follows: a non-technical agent or data collector, given varying amounts of information about common commercial structures in Florida, should be able to use this report to classify structures for insurance purposes with respect to vulnerability against a reference or "base" structure of the same type.

It is first worth noting which features were ultimately modeled as separate modifiers for at least one structure type. These were the features AIR engineers feel are most significant, identifiable, and practical to use in a wide-ranging report on mitigation:

- **Year built** (before or after the Florida Building Code [FBC] took effect in 2002)
- **Geographic region** (for FBC buildings, based on 5-digit ZIP code)
- **Height** (Low, mid, or high-rise by number of stories)
- **Construction Type** (light metal, wood frame, three masonry subtypes, concrete, steel)
- **Roof Geometry** for low-rise buildings (gable without bracing, gable with bracing, hip/mansard/pyramid)
- **Roof Anchorage** for low-rise buildings (nails/screws, anchor bolts, hurricane ties)
- **Roof Deck Attachment** for low-rise buildings (three nail types and spacing)
- **Roof Covering** for most buildings (categories vary by height)
- **Window Protection** for all buildings (none, non-engineered shutters, engineered shutters)
- **Wall Siding** for mid and high-rise buildings (exterior insulation, aluminum/vinyl, masonry/brick veneer)

Not all features were modeled for all structure types, as certain combinations of height, year built, construction type, and mitigation features do not apply or do not make sense.

Roof Geometry

Roof geometry largely determines the magnitude of aerodynamic loads experienced by a particular roof. The geometry affects the intensity of wind pressures and the resulting uplift resistance. Common roof shapes are gable and hip, although a variety of roof shapes are possible. A brief description of some of the roof shapes is provided below.

Gable Roof. This roof slopes in two directions so that the end formed by the intersection of slopes is a vertical triangle.

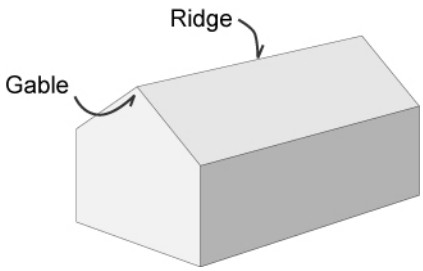


Figure 19: Illustration and Example of Gable Roof

Hip Roof. This roof slopes in four directions such that the end formed by the intersection of slopes is a sloped triangle.

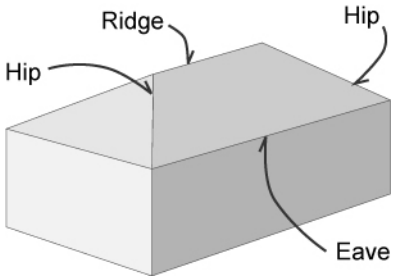


Figure 20: Illustration and Example of Hip Roof

Mansard Roof. Like the hip roof, this roof also slopes in four directions, but there is a break in each slope.

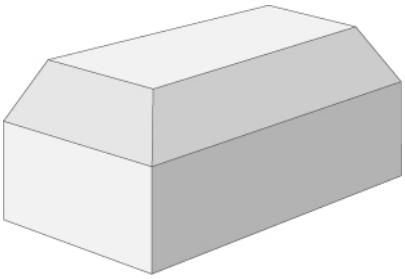


Figure 21: Illustration of Mansard Roof

Roof Covering

The roof covering is the material covering the framework of the roof structure to safeguard the roof against the weather.

The roof covering is fixed to the underlying structure by means of a range of fittings and fixtures. The climatic conditions have a marked influence on the performance and durability of roof coverings. Strong winds may blow off roof coverings such as slates, tiles, and asphalt shingles when they are not properly fixed in position. Extreme temperature changes may cause the

material to crack and joints to leak, if not properly protected. Atmospheric effects of fog, salt, air, smoke and other gases may result in corrosion of metal roofing if not protected by painting. (Clay tiles, slates, shingles, and built up roof coverings are unaffected by atmospheric action.) The various effects described above can result in poor performance, reduced life, or both.

It is the roof deck to which roof coverings are fastened. The decks are supported on structural members such as girders, trusses, or rigid frames. In the case of shell roofs, the decks serve as a principal supporting member. In some cases, the roof covering and the deck are combined into one unit, such as corrugated roofing. Because of these relationships, both the type of roof covering and the type of roof-deck are important features.

The weight of the roof covering affects the design, weight and the cost of both the roof deck and supporting structure or framework. A heavier roof covering requires a stronger supporting structure, which adds to the cost. For example, sheet metal coverings are very lightweight, shingles can be classified as light to medium in weight, and clay tiles and slates are considered to be heavy roof-coverings. Supporting structures and roof decks are designed appropriate to the weight of the chosen roof covering.

Roof Deck

The roof deck transfers the roof loads to the underlying trusses or rafters. Damage to the roof deck constitutes a breach of the building envelope and can result in significant building and interior damage. Some of the commonly used roof decks are plywood, precast concrete slabs, reinforced concrete slabs, and light metal.

AIR models the roof deck and roof deck attachment separately, but as a practical matter it makes sense to present combinations of decking and attachment method most commonly used in the feature tables.

Roof Anchorage

Unless the roof is integrated with the walls, as in the case of a reinforced concrete roof deck, its trusses are anchored to the walls by fasteners such as nails, screws, clips, or hurricane ties. Roof anchorage is the last layer of defense against wind loads which can uplift the entire roof away from the structure. A depiction of a roof anchored with hurricane ties, the strongest type of fastener, is shown in the figure below.

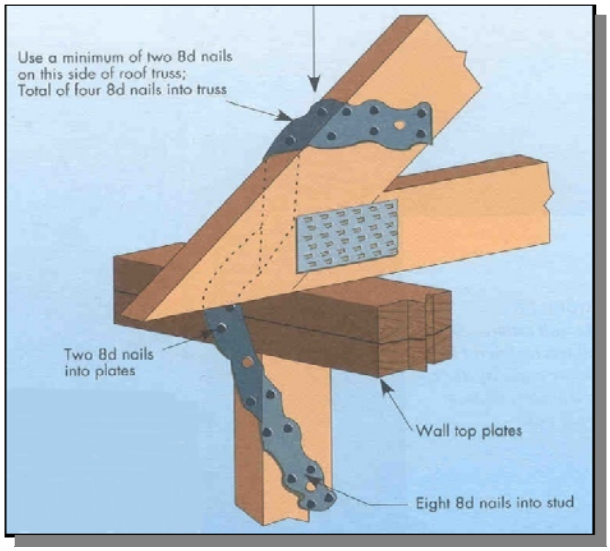


Figure 22: Roof Anchorage with Hurricane Ties

Water Intrusion

Hurricane winds can drive large amounts of water through ventilation openings, doors and windows. This phenomenon has been observed in many field observations for recent hurricanes such as Hurricane Ike. Once water intrusion occurs, both structural damage and contents damage can be expected. This damage is exacerbated if the property is evacuated following the event due to the formation of mold inside the building.

There are a few well-tested mitigation measures to reduce the potential of water-intrusion, such as reinforced ventilation systems for roofs and soffits, adequate window flashing systems and water-proof door assemblies. However, current methods of testing for windows and doors do not account for the large pressures observed in hurricanes, thus water-intrusion has been observed even in well-protected buildings. Future research in this area and improvement of standards will lead to improved materials that will certainly reduce the potential for the occurrence of water intrusion.

Due to this lack of adequate standards and the lack of detailed data from past events, water intrusion mitigation features have not been included in the current analysis. However, roof coverings and opening protection features, which are included in the study, should implicitly account to a certain degree for the water-resistance of a structure. It is however recognized that direct mitigation measures against water intrusion may be more efficient in reduction of hurricane losses in commercial structures.

AIR is constantly reviewing data from past events and research regarding mitigation measures and will continue to study the inclusion of specific water intrusion mitigation features in the future if they are corroborated by test data and adequate performance under real events.

Mitigation Analysis Modeling Approach

Using a hurricane model to build relative loss cost tables for structural mitigation analysis involves a few major steps:

1. Define the model, catalog, and analysis options to be used in the analysis;
2. Define the data set to be used as the spectrum of property types and locations for the analysis;
3. Apply the model to the data set to generate damage estimates at each modeled location;
4. Process the model results over all simulated hurricanes and locations, grouping results into regions and building types used in the feature tables;
5. Calculate the loss costs in each "cell" of the tables and the relative loss costs to the base cell, which comes from the table of loss costs for unknown feature detail.

Model, Catalog, and Analysis Options

The AIR hurricane model and the architecture of its key components are discussed above. Version 10.5 of the hurricane model, released in Fall 2008, was used for this report. Notable analysis options for this report include the use of AIR's 10,000-year "Standard" hurricane catalog based on historical hurricane data from the previous 107 years, and the use of other analysis options generally in accordance with the template accepted by the Florida Commission on Hurricane Loss Projection Methodology[4]. This template includes the use of annual aggregate demand surge adjustments to losses and the exclusion of all storm surge losses.

Notional Portfolio Rationale and Construction

The model can analyze any property data record presented to it, whether or not that record is identifiable and traceable as a structure that actually exists on the ground. For mitigation analysis, it is more efficient, comprehensive, and unbiased to build a "notional" data set of hypothetical properties and apply the model to this experimental data. The reasons for this include:

- Ability to capture all geographical areas and structure types to be used in the analysis, without gaps or concentrations in certain common structure types or bias toward highly populated areas;
- Ability to ensure all combinations of detailed features are analyzed, whether or not they are common or reflected in any actual insurance data available to the model;

[4] The Florida Commission is a body created by the Florida Legislature to review hurricane simulation models for acceptability for the purposes of estimating personal residential loss costs and probable maximum losses which are acceptable in rate filings. While the task here relates to commercial structures, it is sensible to use analysis options which are otherwise consistent with the Commission's acceptability process as far as possible. See www.sbafla.com/methodology for more information about the Commission, particularly its annual Report of Activities outlining its Standards and acceptability process.

- Ability to sensitivity test the results and relative loss costs to changes in the geographical or construction type distributions.

A notional portfolio is constructed by first defining every combination of possible construction types, years built, heights, and detailed mitigation features to be tested and creating a unique property data record for each combination.

Second, this package of hypothetical properties covering "all the bases" is placed at a defined set of latitude-longitude points ("geocodes") which are selected to ensure comprehensive statewide coverage. This is particularly important when the individual risk model may offer different relative loss cost indications by region, as is the case in Florida for structures built to the FBC. The portfolio used for this analysis consists of one location at the population-weighted centroid of each selected 5-digit ZIP code. The ZIP codes in turn are selected so that at least one representative ZIP code is used within each county in Florida, and that every possible FBC region within a county is also covered. For example, Lee County includes areas classified in FBC regions 1, 4, and 5, so at least three ZIP codes – one with a centroid within each region – were used within this county. In all, 124 ZIP codes were selected.

Third, the entire portfolio is weighted by entering a replacement value by coverage for each record. In some cases, non-uniform weights may be appropriate, but for mitigation analysis relative loss costs are the ultimate statistic of interest. When working with relativities, the replacement value weights will cancel out anyway, so a constant replacement value is selected for each hypothetical property. In this analysis, we have used $1,000,000 as the structure replacement value.

Analysis Processing and Calculation of Relative Loss Costs

The hurricane simulation analysis produces fundamental outputs of the losses by storm, by location. Database operations are used to aggregate or "roll up" the results to the form of loss costs by property type over all simulated locations in each region – in other words, one loss cost for each "cell" in one of the tables in Exhibits 11 through 24. The structure of these exhibits will be explained fully in the next section.

Using Relative Loss Cost Tables to Analyze Mitigation Status of Commercial Structures

Exhibits 11 to 24 show the layout of the various combinations of construction and mitigation features used in the analysis and the corresponding loss costs and relative loss cost results. This section explains how to determine a relative loss cost against a reference structure depending on how much information the user has about the commercial structure of interest.

What is a relative loss cost and why do we use it as a measure of vulnerability? While a full discussion of the actuarial rationale for using loss costs is beyond the scope of this report, in brief the loss cost is the best representation of the expected (or average) future annual losses to a structure over a long period of time, and is also the core statistic used in making insurance rates for property lines. In non-catastrophe property insurance, such as for fire losses, the loss cost

might be estimated using historical claims data for many similar properties. For catastrophic perils, this approach is impractical due to an insufficient number of events, and so catastrophe models substitute as the generator of proxy historical data based on thousands of years of simulated hurricanes.

Whatever the source of the data, the average annual loss (AAL) is simply the sum of all losses divided by the number of years over which those losses occurred. The AIR model typically uses 10,000 years of simulated hurricane experience, storm by storm, and so the modeled AAL for a building is the sum of the losses from all events striking it in the catalog divided by 10,000. Then the loss cost is the AAL per unit of exposure (usually $1,000).

The relative loss cost (a.k.a. relativity, differential, premium modifier) is just the ratio of the loss cost for a building of interest to the loss cost for a "base" or reference building underlying the insurance rates. Less vulnerable buildings have a lower relative loss cost and should get a "mitigation credit" applied to insurance base rates – if and only if those base rates are actuarially adequate and aligned with the mitigation rating plan. Likewise, more vulnerable buildings have a higher relative loss cost, and those with relative loss costs of greater than 1.00 (to the base building underlying the rates) should get a "lack of mitigation debit" to their rates.

Relative loss costs can be calculated using two sensible reference structures as the denominator. The first is the loss cost for a building in the same region, with the same known height and year built, and the same basic construction type, but with no known mitigation feature detail. This is useful because if a portfolio of such buildings were modeled by an insurer, other features would be automatically set to "unknown" by the model, and the results underlying its rates would reflect this level of detail. Consequently, the mitigation credit arising from such a relative loss cost would likely be relevant to a typical insurer's base rates.

However, it is also feasible that an insurer could create base rates for a structure identified as "worst in class" or the weakest feature combination within a known construction type, year built, height, and regional combination. This would be compatible with a desire to provide an "all-credit" relative loss cost table where no structure would be penalized in a rate table.

AIR has chosen to define the base structures as those in Exhibit 13 for each region, and loss costs are shown in Exhibits 14 through 24 relative to the unknown level of feature detail for the corresponding structures in Exhibit 13. It is easy to convert from one base to another by simply converting the relative loss cost in any cell to a pure loss cost in dollars – namely, multiplying the relative loss cost in, say, Exhibit 15 times the loss cost shown in Exhibit 13 for the corresponding reference structure. This dollar loss cost can then be divided by the dollar loss cost for the weakest (or the strongest, or any other base, for that matter) structure in Exhibit 15 to produce an alternate relativity to a different base. The same procedure would work for any other table with feature detail.

The roughest case is one where the user only knows where the structure is, its number of stories, and the year it was built. In this case, there is not too much light the model can shed on its vulnerability. Even with all the unknowns – basic construction type as well as detailed features – it is possible to make a broad statement about vulnerability. The AIR IRM in Florida operates

according to regions of the state for buildings built after 2001 (year built is a proxy for the effective date of the FBC, which applied to all buildings permitted after March 1, 2002). Under the FBC, codes were more closely tied to ASCE 7-98 Wind Speed Zones, with exceptions for coastal and barrier island areas around the state as well as for the High Velocity Hurricane Zone in Broward, Miami-Dade, and Monroe counties. This resulted in six regions, not necessarily subsets of the four regions used for pre-2002 construction. Broad maps of the post-2001 regions are shown in Figure 23 below.

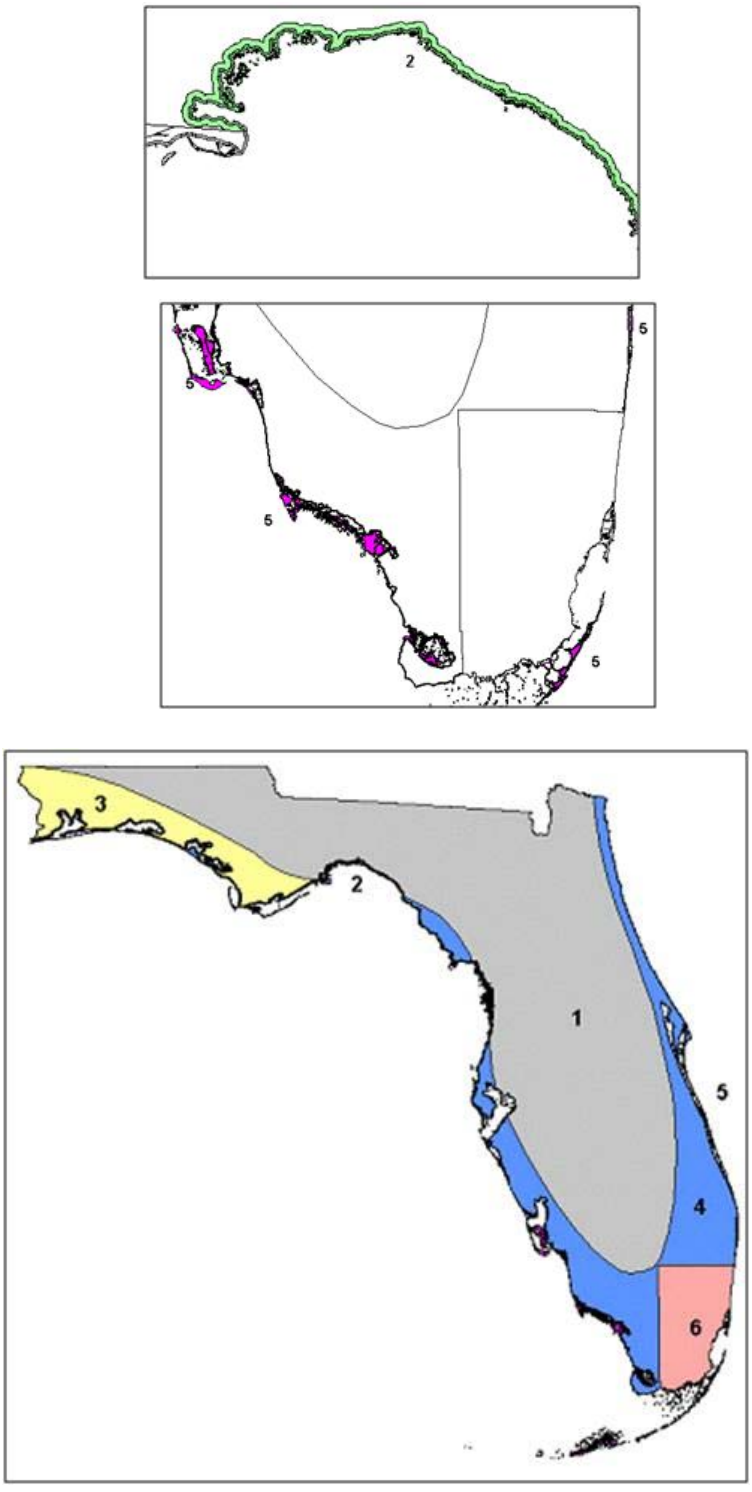


Figure 23: Post-2001 FBC Regions Used in Analysis

For ease of use, the regions for post-2001 FBC construction have been approximately mapped to 5-digit ZIP Codes for this report. Therefore the first step is always to determine the year built and ZIP Code of a structure, and then match it to a region using Exhibit 11. Once the region is identified, a regional relativity to a selected base case (such as pre-2002 low-rise construction) could be established using Exhibit 13.

More commonly, the basic construction type will also be known, even if feature detail is not. This is essentially the "unknown" base case which will be tied to the later tables which do consider feature detail and serve as the denominator of their relative loss costs. In Exhibit 13, the number of stories, year built, and construction type can be used to examine the relative vulnerability, as measured by loss costs, of various types of structures by region of Florida even though no mitigation information may be available.[5]

The most useful case for mitigation analysis is, of course, when detailed knowledge of construction features significantly affecting hurricane wind losses is available. Depending upon the year built, height, and basic construction type, the user selects a table of more detailed mitigation features and their relative loss costs. These tables are presented in Exhibits 14 through 24. The user selects the final relative loss cost table, then uses the appropriate table to determine a mitigation credit or debit relative to the "base" structure tied back to a specific cell in Exhibit 13.

How-To Example of Mitigation Modifier Determination

A worked example may help clarify the procedure. Suppose an insurance agent receives an application for a two-story structure with the following data:

- Replacement value of structure: $500,000
- ZIP Code: 32653
- Year built: 1990
- Height: two-story
- Construction type: wood frame
- Roof geometry: hip
- Roof anchorage: nails
- Roof deck attachment: 6d nails @ 6"/12"
- Roof covering: FBC equivalent shingles (shingles appear to have been replaced)
- Window protection: none

Step 1 is to determine the region for the building. Pre-2002 buildings need not be classified by region. If the building were post-2001, the loss cost and relativity for that particular region would be used in the later steps.

Step 2 is to determine the level of detail known. Since the construction type is known and feature detail is available, Exhibits 12 and 13 are bypassed (for now) and we use the construction type and year built to find the appropriate table to use for the relative loss cost – in this case, Exhibit 15.

[5] AIR's construction type codes are quite detailed, with many sub-types often allowable in the model and classified as separate codes. In this report, we have grouped construction types into seven main categories which encompass one or more AIR type codes and substitute a code representing the most common building type within the group.

Step 3 is to find the relative loss cost, which may be used by insurers as a premium modifier for mitigation. Reading Exhibit 15 for the feature combination described above, the user finds a relative loss cost of .86 or "mitigation credit" of -14%. In a typical rating algorithm, this modifier would be applied to the hurricane portion of the base premium otherwise applicable to a similar structure with unknown mitigation features.

Step 4 (if desired) is to find the reference loss cost for a "base" structure. Considering only the year built, height, and basic construction type, Exhibit 13 shows a loss cost of 2.621 when feature detail is unknown.

Step 5 (if desired) is to translate the relative loss cost into a dollar figure for the reduction in average annual losses, using the following formula:

Replacement Value of Structure (in thousands)

x (Base Loss Cost)

x (1 - Relative Loss Cost)

= Reduction in Average Annual Hurricane Wind Losses for a building with the given features.

In this case, $500 x (2.621) x (0.14) = $183 is the amount of expected annual savings due to the mitigation features applicable to this structure – namely, the hip-style roof and the FBC-equivalent shingles – relative to other low-rise structures of the same value built before 2002.

Discussion of Results of Mitigation Analysis

The results of modeling buildings around the state with unknown construction types and feature detail were straightforward. Exhibit 12 provides a simple summary of the vulnerability differences for low and high-rise buildings built before and after the Florida Building Code took effect in 2002. Not surprisingly, low-rise buildings built before 2002 have the highest loss costs, with high-rise and post-2001 buildings showing lower loss costs. The base loss cost of 1.832 per $1,000 of exposure means, for example, a $500,000 building would have a long-term average annual expected hurricane loss of $916 for the coverages modeled. The IRM indicates that, absent any specific knowledge about construction types, mid and high-rise structures have only about 35% of the loss costs of low-rise buildings, and structures built to the 2001 FBC have loss costs about 70% of those for pre-2002 buildings.

Exhibit 13 extends the summary to the typical situation where overall construction type, but not feature detail, is known. The weakest structures (highest loss costs) tend to be low-rise, pre-2002 structures in the wood frame and light metal construction types, with masonry, concrete and steel types becoming progressively less vulnerable. Mid-rise (4 to 7 stories) and high-rise (8 or more stories), as well as post-2001, buildings also exhibit lower loss costs.

AIR uses a long list of detailed construction type codes, but a representative code can be selected for each of the seven common construction type groups in Florida (listed with typical occupancies, from most to least vulnerable):

- **Light metal** – gasoline stations and small industrial

- **Wood frame** – low-rise homes, multi-family dwellings, and small commercial
- **Joisted masonry** – low-rise structures with masonry walls but combustible roofs anchored in a similar manner as they would be to wood frame walls
- **Masonry** – low-rise homes, mid-rise multifamily units, offices and retail
- **Reinforced masonry** – mid and high-rise multifamily units, offices, and hospitals
- **Reinforced concrete** – offices, hospitals and major commercial facilities
- **Steel** - offices, hospitals and major commercial facilities

This exhibit serves another important purpose, which is to establish the concept of a reference building with "unknown" feature detail as a base for the relative loss costs of various buildings with known feature detail in the tables to follow. In other words, the answer to the question "relative to what?" when viewing relative loss costs in other tables.

The IRM indicates wide variation in relative loss costs for low-rise pre-2002 buildings, from .42 for reinforced concrete construction, up to relativities of 1.95 (or 95% above base) for light metal structures. For mid-rise pre-2002 structures, reinforced concrete and steel structures show loss costs around 20% below average (relative loss cost of .80) but joisted masonry structures are significantly more loss-prone than other mid-rise at 2.23 (or 123% above base). High-rise structures show relative loss costs of only .60 (about 40% better than the base of all mid and high-rise structures).

Structures built to the FBC in general perform 15% to 30% better on loss costs than structures of the same construction types built pre-2002. Among construction types within the stock of FBC structures, the relative loss costs fall in a similar range to those for pre-2002 structures.

Exhibits 14 through 19 cover low-rise, pre-2002 structures of the various applicable construction type groups: frame, masonry, and concrete. Exhibit 20 covers the same situations when the structures are built to the post-2001 FBC. Mid-rise buildings are routed to Exhibit 21 for pre-2002 and Exhibit 22 for post-2001 years built. High-rise buildings are likewise routed to Exhibit 23 for pre-2002 and Exhibit 24 for post-2001 years built.

The most complex feature tables are for low-rise buildings built prior to 2002, since they exhibit the widest range of possible features, particularly in the roof system. The features considered are listed and categories summarized from (generally) most to least vulnerable:

- Roof geometry: gable or others; gable with braced ends; hip-mansard-pyramid
- Roof anchorage: nails/screws; anchor bolts; hurricane ties (a.k.a. single or double wraps)
- Roof deck attachment: three nail and spacing combinations (see tables) and structurally connected decks for light metal structures

- Roof covering: light metal panels[6]; non-wind-rated asphalt shingles; wind-rated FBC equivalent shingles; built-up[7]
- Window protection: none; non-engineered shutters (such as plywood panels); engineered shutters (designed for hurricanes as roll-up or accordion type)

Within the low-rise pre-2002 class, light metal buildings have fewer feature options than wood frame, masonry and concrete buildings. Hip roof geometry, roofs anchored with hurricane ties, and built-up roof coverings are not applicable to light metal structures.

Relative loss costs for light metal buildings still range from .79 to 1.14, indicating that even for this vulnerable construction type, some feature combinations (braced gable ends, anchor bolts on the roof, structurally connected decks, engineered shutters) perform better than others (unbraced gable roofs, nailed roof anchors, metal panel roof covers).

For wood frame types, relative loss costs vary from about .60 to 1.06, with "mitigation credits" of up to 40% (1-.60) applicable for feature combinations such as hip roofs anchored with hurricane ties, whose decks are attached with 8d nails at 6" spacing and 6" on center, FBC-equivalent shingles, and engineered shutters. As the basic construction type becomes less vulnerable (e.g. from frame to joisted masonry, unreinforced masonry, then reinforced masonry and concrete), since the "base" building is a better structure, there are more and more significant "lack of mitigation debits" for poor secondary features than there are "mitigation credits" for good feature combinations. The following table illustrates the variations by construction type for pre-2002 low-rise buildings:

Construction Type	Well-mitigated relativity	Typical unmitigated relativity
Wood Frame	.60 (hip roof, hurricane ties, FBC shingles, engineered shutters)	1.02 (unbraced gable roof, nail roof anchorage, asphalt shingles, no shutters)
Joisted Masonry	.66 (same features as above)	1.08 (same features as above)
Unreinforced Masonry	.74 (same features as above)	1.16 (same features as above)
Reinforced Masonry	.73 (same features as above)	1.17 (same features as above)
Reinforced Concrete	.73 (same features as above)	1.17 (same features as above)

[6] Metal panels formed in a corrugated fashion (for older structures) or standing-seam panels interlocked on site for newer construction.
[7] Built-up roofs refer to the process of layering plies of coated or saturated roofing felts with asphalt, pitch or other bituminous material on a roof deck. The final layer is finished with an aggregate for protection. This roof cover is also typically used on low pitch and flat roofs.

Low-rise structures built to the post-2001 FBC are endowed with far better standard mitigation features, and these are considered "automatically" in the hurricane model. Therefore, the feature options for additional mitigation are limited to window protection. Roof anchorage, roof deck attachments, and roof covering feature options are pre-set in the model based on the building code by post-2001 region of the state. Roof geometry can be either gable, flat, or hip, and is specified by the FBC.

However, note that an implied mitigation modifier can be examined by simply relating the loss cost for post-2001 low-rise structures of a given construction type to that for pre-2002 construction of the same type. If an insurer did not have separate base rates for pre-2002 and post-2001 structures, this could be used as a mitigation credit for low-rise FBC buildings by region. Depending on construction type, all else equal, FBC 2001 buildings enjoy relative loss costs 15% (light metal) to 30% (wood frame) lower than the same buildings built before 2002. Adding window protection can increase their mitigation credits to as much as 40%.

Mid and high-rise structures are fundamentally subject to different engineering and generally less vulnerable to wind loads. There are still a few feature options which affect relative loss costs, listed here from most to least vulnerable:

- **Roof covering**: Built-up with gravel or single-ply membrane[8]
- **Window protection**: none, non-engineered shutters, engineered shutters
- **Wall siding**: Exterior insulation finishing system (EIFS)[9], aluminum/vinyl siding, masonry/brick veneer

The addition of wall siding to the feature list reflects that with less vulnerability due to poorly engineered roof systems, siding and window damage become the main sources of significant hurricane wind losses for mid and high-rise structures.

Once construction type is known, the IRM can segregate loss costs for mid-rise (4-7 stories) versus high-rise (8 or more stories) structures. For mid-rise in Exhibit 21, additional features can add as much as 11% or mitigate as much as 18% of relative loss costs, with exterior insulation finishing system (EIFS) wall siding the largest "debit" and installation of engineered shutters the most effective "credit" feature. These conclusions do not vary significantly by basic construction type.

Mid-rise structures, as shown in Exhibit 22, built to the 2001 FBC are generally less loss-prone by between 6% (relative loss cost of .94) and 33% (.67) than their pre-2002 counterparts. On the other hand, relative to the basic construction type with unknown feature detail, we see ranges of relative loss costs between .78 (22% mitigation credit) and 1.33 (33% debit), but this conclusion

[8] Generally used on low pitch roofs, single-ply membranes refer to a group of materials such as EPDM, PVC, or other synthetics that are laid over a roof deck in one layer as a roof cover. Also known as rubber roofing, the membrane can either be mechanically fastened or fully adhered to the roof deck.

[9] EIFS (exterior insulation and finish system) is typically a 3-layer method that consists of a layer of rigid insulation board - such as expanded polystyrene - adhered to the wall sheathing, then a layer of cementitious material that has reinforcing - such as a fiberglass mesh - embedded into it, followed by a topcoat layer of paint-like / plaster-like trowel on material. Another method of installation uses mechanical fasteners to attach the insulation board to the sheathing, which is designed to create a drainage layer between the insulation and the wall sheathing.

depends heavily on the region of the state – since the post-2001 FBC relativities are regional but the pre-2002 relativities are not.

Finally, the same analysis for high-rise buildings, which are of only two primary construction types (concrete and steel), shows relative loss costs of 1.09 (9% debit) for unmitigated structures with EIFS siding, down to .82 (18% credit) for buildings of the same types with engineered shutters, built-up roofs, and veneer siding. Post-2001 FBC buildings can be from 6% to 30% less loss-prone (relative loss costs of .70 to .94) than the base building of the same construction type of pre-2002 vintage, depending on their feature combinations. When considered against other post-2001 buildings of the same types as the base, however, the range of relative loss costs is from .78 to 1.27.

Implications

Given the many possibilities for building codes, height groups, construction types, and different mitigation features applying to each, it is impossible to generalize the analysis results into one simple conclusion, but it is possible to note some general contributors to the relative vulnerability of commercial structures in Florida.

- First, some simple directional trends for relative loss costs (a measure of vulnerability and required insurance rates), considering one feature at a time.
    - Year built: pre-2002 > post-2001 FBC (note other available feature combinations differ by year built, since some are required or proscribed by the FBC)
    - Height: low-rise > mid-rise > high-rise
    - Construction type: light metal > wood frame > joisted masonry > unreinforced masonry > reinforced masonry > concrete and steel
    - Window protection: none > non-engineered shutters > engineered shutters
    - Roof cover (low-rise): light metal panels > asphalt shingles > FBC equivalent or built-up
    - Roof geometry (low-rise): gable unbraced > gable braced > hip-mansard-pyramid
    - Roof anchorage (low-rise): nails/screws > anchor bolts > hurricane ties
    - Roof deck attachments (low-rise): larger nails more closely spaced are better, structural connections best where applicable
    - Wall siding (high-rise): EIFS > aluminum/vinyl siding > masonry/brick veneer
- Which features influence relative loss costs most significantly?

- For low-rise pre-2002, window protection, roof geometry and roof cover can cause a 10% to 15% swing in relative loss costs in many types. Roof anchorage and roof deck attachments can make a smaller swing on the order of 5%.
- For low-rise post-2001, most features are prescribed by FBC, which itself makes a -15% to -30% difference from pre-2002. Window protection can subtract another 10-15% from relative loss costs.
- For mid and high-rise buildings built pre-2002, wall siding can cause a 15% swing in relative loss costs (EIFS versus veneer), while window protection can mitigate losses by up to an additional 15%. Roof cover makes less difference, on the order of 1-2%.
- For mid and high-rise structures built after the 2001 FBC, wall siding affects relative losses even more, from a 15% swing in interior Florida to 30% or more on the southern coast. Window protection still makes up to a 15% difference, but depending on region of Florida, and roof cover is still not a major factor.
- Mid and high-rise structures built to the 2001 FBC are generally 6% to 30% less loss-prone than the same types of buildings built pre-2002, depending on the additional mitigation features used.

- What did we learn? What are the actionable items emerging from this analysis?
  - Building codes matter and should continue to be progressively strengthened.
  - Loss costs for the best buildings can be reduced by up to 30-40% in some cases from those which would apply to unmitigated buildings of the same basic types, but only by the right combinations of retrofits or construction practices.
  - There are opportunities to retrofit the most vulnerable structures – low-rise pre-2002 buildings – with engineered shutters, as well as replacement of roof decks, covers, and anchors.
  - For mid and high-rise structures, by far the most effective mitigation measure other than installation of shutters is replacement of EIFS wall siding, preferably with brick/masonry veneer siding.

The first step to effective action is knowledge of the exposed property, the level of risk, and the major contributing features to that risk. AIR appreciates the opportunity to contribute to the knowledge of these factors and potentially influence the enhancement of emergency management and hurricane wind loss mitigation in Florida.

Appendices

Appendix 1: Exhibits

County Name	Risks	Structure	Contents	Time Element	Total	% of State	Avg Structure Value
Alachua	5816	10,727,890,150	3,616,334,405	2,142,162,230	16,486,386,785	1.3%	1,844,548
Baker	466	592,961,509	194,785,586	100,457,302	888,204,397	0.1%	1,272,450
Bay	5039	12,691,476,934	4,116,496,921	2,541,619,027	19,349,592,883	1.5%	2,518,650
Bradford	602	664,564,604	228,227,123	137,022,168	1,029,813,894	0.1%	1,103,928
Brevard	11986	20,320,378,967	7,722,231,665	4,898,158,453	32,940,769,085	2.5%	1,695,343
Broward	41944	89,570,334,737	34,448,954,316	20,474,266,789	144,493,555,841	11.1%	2,135,474
Calhoun	325	338,291,922	122,937,035	73,339,700	534,568,657	0.0%	1,040,898
Charlotte	3324	4,786,507,063	1,779,591,247	1,167,075,533	7,733,173,843	0.6%	1,439,984
Citrus	3744	2,967,391,815	1,107,729,476	688,021,107	4,763,142,397	0.4%	792,573
Clay	2459	4,185,990,195	1,564,155,197	1,061,181,532	6,811,326,923	0.5%	1,702,314
Collier	9214	15,494,529,996	5,284,947,417	3,385,507,581	24,164,984,995	1.9%	1,681,629
Columbia	1511	1,732,202,549	632,330,574	395,649,860	2,760,182,983	0.2%	1,146,395
De Soto	678	656,029,756	304,388,631	139,529,973	1,099,948,360	0.1%	967,596
Dixie	164	96,908,818	39,251,269	23,890,932	160,051,019	0.0%	590,907
Duval	17998	39,426,171,608	15,585,859,457	8,842,046,882	63,854,077,947	4.9%	2,190,586
Escambia	7434	17,767,534,712	6,265,282,319	4,005,988,099	28,038,805,130	2.2%	2,390,037
Flagler	1373	1,800,546,109	699,745,255	425,499,863	2,925,791,227	0.2%	1,311,396
Franklin	551	542,787,265	162,972,094	95,108,467	800,867,825	0.1%	985,095
Gadsden	896	1,453,655,075	511,022,869	313,861,445	2,278,539,389	0.2%	1,622,383
Gilchrist	271	206,847,515	73,478,489	43,638,707	323,964,711	0.0%	763,275
Glades	139	108,463,508	42,599,786	20,859,424	171,922,718	0.0%	780,313
Gulf	579	620,922,146	189,505,417	127,860,530	938,288,093	0.1%	1,072,404
Hamilton	267	328,285,707	121,798,720	76,528,776	526,613,203	0.0%	1,229,534
Hardee	617	473,384,645	176,308,348	88,815,262	738,508,255	0.1%	767,236
Hendry	846	966,295,010	469,742,660	221,744,279	1,657,781,949	0.1%	1,142,193
Hernando	3952	3,827,170,832	1,411,034,026	883,761,637	6,121,966,495	0.5%	968,414
Highlands	2786	2,879,501,014	1,087,630,172	665,937,143	4,633,068,329	0.4%	1,033,561
Hillsborough	25800	54,111,601,506	20,928,596,928	12,497,083,442	87,537,281,875	6.7%	2,097,349
Holmes	324	373,447,726	108,197,506	66,388,097	548,033,329	0.0%	1,152,616
Indian River	4270	5,379,077,209	2,034,480,781	1,252,557,096	8,666,115,086	0.7%	1,259,737
Jackson	1274	1,697,711,818	552,949,304	329,583,775	2,580,244,896	0.2%	1,332,584
Jefferson	396	266,566,239	88,429,307	49,297,143	404,292,690	0.0%	673,147
Lafayette	117	65,290,779	26,548,814	15,997,779	107,837,372	0.0%	558,041
Lake	7716	8,829,496,592	3,337,351,115	2,127,933,383	14,294,781,090	1.1%	1,144,310
Lee	12995	23,556,592,715	8,541,371,908	5,477,692,266	37,575,656,889	2.9%	1,812,743
Leon	6829	15,761,503,547	5,270,702,536	3,247,785,103	24,279,991,185	1.9%	2,308,025
Levy	1045	794,837,793	281,374,151	173,788,925	1,250,000,869	0.1%	760,610
Liberty	171	199,786,738	68,929,547	38,022,236	306,738,521	0.0%	1,168,343
Madison	430	342,199,742	122,571,900	68,053,132	532,824,773	0.0%	795,813
Manatee	7268	11,027,616,181	4,300,334,372	2,639,094,631	17,967,045,184	1.4%	1,517,283
Marion	7461	9,026,923,378	3,717,265,759	2,105,779,548	14,849,968,686	1.1%	1,209,881
Martin	5004	6,717,913,140	2,685,886,251	1,679,198,599	11,082,997,990	0.9%	1,342,509
Miami-Dade	53717	122,304,953,390	45,409,249,088	27,343,993,350	195,058,195,828	15.0%	2,276,839
Monroe	3867	6,365,139,347	1,818,571,089	1,228,739,804	9,412,450,240	0.7%	1,646,015
Nassau	1622	1,935,074,418	631,318,767	407,854,788	2,974,247,973	0.2%	1,193,018
Okaloosa	5029	12,635,959,064	4,170,425,774	2,746,765,456	19,553,150,293	1.5%	2,512,619
Okeechobee	1060	776,088,303	294,439,086	176,053,078	1,246,580,467	0.1%	732,159
Orange	28294	73,346,478,670	24,835,695,525	15,161,472,910	113,343,647,105	8.7%	2,592,298
Osceola	5800	10,419,864,315	2,803,958,277	1,962,453,856	15,186,276,448	1.2%	1,796,528
Palm Beach	29082	62,879,736,231	23,765,755,831	13,963,589,671	100,609,081,733	7.8%	2,162,153
Pasco	8607	9,728,069,587	3,541,449,755	2,220,016,646	15,489,535,988	1.2%	1,130,251
Pinellas	22371	44,851,267,347	17,166,703,718	9,897,981,520	71,915,952,585	5.5%	2,004,884
Polk	12217	16,370,045,292	6,531,892,006	3,773,836,333	26,675,773,631	2.1%	1,339,940
Putnam	1832	1,655,017,964	691,607,698	391,131,918	2,737,757,581	0.2%	903,394
Saint Johns	3858	5,301,410,421	1,822,223,424	1,156,362,297	8,279,996,142	0.6%	1,374,134
Saint Lucie	5553	7,321,076,654	2,845,620,881	1,733,670,765	11,900,368,300	0.9%	1,318,400
Santa Rosa	3374	4,491,048,489	1,512,342,831	954,209,731	6,957,601,051	0.5%	1,331,075
Sarasota	11380	18,509,153,168	6,895,466,150	4,401,652,540	29,806,271,858	2.3%	1,626,463
Seminole	9825	16,761,096,486	6,660,734,019	3,974,186,733	27,396,017,238	2.1%	1,705,964
Sumter	1183	1,086,880,198	408,293,540	247,461,198	1,742,634,935	0.1%	918,749
Suwannee	884	755,475,288	287,723,345	168,365,600	1,211,564,234	0.1%	854,610
Taylor	583	660,133,590	269,184,676	150,633,120	1,079,951,386	0.1%	1,132,305
Union	171	187,146,247	65,420,234	40,289,235	292,855,716	0.0%	1,094,422
Volusia	12312	18,685,517,314	6,465,370,662	4,216,157,545	29,367,045,521	2.3%	1,517,667
Wakulla	610	557,119,004	192,156,677	115,436,632	864,712,313	0.1%	913,310
Walton	1392	3,588,993,092	922,515,092	639,507,428	5,151,015,611	0.4%	2,578,300
Washington	504	633,951,974	180,161,489	106,102,235	920,215,697	0.1%	1,257,841
Statewide	**431,208**	**815,184,285,117**	**300,212,610,283**	**181,985,712,243**	**1,297,382,607,642**	**100.0%**	**1,890,467**

County Name	Risks	Structure	Contents	Time Element	Total	% of State	Avg Structure Value
Miami-Dade	53717	122,304,953,390	45,409,249,088	27,343,993,350	195,058,195,828	15.0%	2,276,839
Broward	41944	89,570,334,737	34,448,954,316	20,474,266,789	144,493,555,841	11.1%	2,135,474
Orange	28294	73,346,478,670	24,835,695,525	15,161,472,910	113,343,647,105	8.7%	2,592,298
Palm Beach	29082	62,879,736,231	23,765,755,831	13,963,589,671	100,609,081,733	7.8%	2,162,153
Hillsborough	25800	54,111,601,506	20,928,596,928	12,497,083,442	87,537,281,875	6.7%	2,097,349
Pinellas	22371	44,851,267,347	17,166,703,718	9,897,981,520	71,915,952,585	5.5%	2,004,884
Duval	17998	39,426,171,608	15,585,859,457	8,842,046,882	63,854,077,947	4.9%	2,190,586
Lee	12995	23,556,592,715	8,541,371,908	5,477,692,266	37,575,656,889	2.9%	1,812,743
Brevard	11986	20,320,378,967	7,722,231,665	4,898,158,453	32,940,769,085	2.5%	1,695,343
Sarasota	11380	18,509,153,168	6,895,466,150	4,401,652,540	29,806,271,858	2.3%	1,626,463
Volusia	12312	18,685,517,314	6,465,370,662	4,216,157,545	29,367,045,521	2.3%	1,517,667
Escambia	7434	17,767,534,712	6,265,282,319	4,005,988,099	28,038,805,130	2.2%	2,390,037
Seminole	9825	16,761,096,486	6,660,734,019	3,974,186,733	27,396,017,238	2.1%	1,705,964
Polk	12217	16,370,045,292	6,531,892,006	3,773,836,333	26,675,773,631	2.1%	1,339,940
Leon	6829	15,761,503,547	5,270,702,536	3,247,785,103	24,279,991,185	1.9%	2,308,025
Collier	9214	15,494,529,996	5,284,947,417	3,385,507,581	24,164,984,995	1.9%	1,681,629
Okaloosa	5029	12,635,959,064	4,170,425,774	2,746,765,456	19,553,150,293	1.5%	2,512,619
Bay	5039	12,691,476,934	4,116,496,921	2,541,619,027	19,349,592,883	1.5%	2,518,650
Manatee	7268	11,027,616,181	4,300,334,372	2,639,094,631	17,967,045,184	1.4%	1,517,283
Alachua	5816	10,727,890,150	3,616,334,405	2,142,162,230	16,486,386,785	1.3%	1,844,548
Pasco	8607	9,728,069,587	3,541,449,755	2,220,016,646	15,489,535,988	1.2%	1,130,251
Osceola	5800	10,419,864,315	2,803,958,277	1,962,453,856	15,186,276,448	1.2%	1,796,528
Marion	7461	9,026,923,378	3,717,265,759	2,105,779,548	14,849,968,686	1.1%	1,209,881
Lake	7716	8,829,496,592	3,337,351,115	2,127,933,383	14,294,781,090	1.1%	1,144,310
Saint Lucie	5553	7,321,076,654	2,845,620,881	1,733,670,765	11,900,368,300	0.9%	1,318,400
Martin	5004	6,717,913,140	2,685,886,251	1,679,198,599	11,082,997,990	0.9%	1,342,509
Monroe	3867	6,365,139,347	1,818,571,089	1,228,739,804	9,412,450,240	0.7%	1,646,015
Indian River	4270	5,379,077,209	2,034,480,781	1,252,557,096	8,666,115,086	0.7%	1,259,737
Saint Johns	3858	5,301,410,421	1,822,223,424	1,156,362,297	8,279,996,142	0.6%	1,374,134
Charlotte	3324	4,786,507,063	1,779,591,247	1,167,075,533	7,733,173,843	0.6%	1,439,984
Santa Rosa	3374	4,491,048,489	1,512,342,831	954,209,731	6,957,601,051	0.5%	1,331,075
Clay	2459	4,185,990,195	1,564,155,197	1,061,181,532	6,811,326,923	0.5%	1,702,314
Hernando	3952	3,827,170,832	1,411,034,026	883,761,637	6,121,966,495	0.5%	968,414
Walton	1392	3,588,993,092	922,515,092	639,507,428	5,151,015,611	0.4%	2,578,300
Citrus	3744	2,967,391,815	1,107,729,476	688,021,107	4,763,142,397	0.4%	792,573
Highlands	2786	2,879,501,014	1,087,630,172	665,937,143	4,633,068,329	0.4%	1,033,561
Nassau	1622	1,935,074,418	631,318,767	407,854,788	2,974,247,973	0.2%	1,193,018
Flagler	1373	1,800,546,109	699,745,255	425,499,863	2,925,791,227	0.2%	1,311,396
Columbia	1511	1,732,202,549	632,330,574	395,649,860	2,760,182,983	0.2%	1,146,395
Putnam	1832	1,655,017,964	691,607,698	391,131,918	2,737,757,581	0.2%	903,394
Jackson	1274	1,697,711,818	552,949,304	329,583,775	2,580,244,896	0.2%	1,332,584
Gadsden	896	1,453,655,075	511,022,869	313,861,445	2,278,539,389	0.2%	1,622,383
Sumter	1183	1,086,880,198	408,293,540	247,461,198	1,742,634,935	0.1%	918,749
Hendry	846	966,295,010	469,742,660	221,744,279	1,657,781,949	0.1%	1,142,193
Levy	1045	794,837,793	281,374,151	173,788,925	1,250,000,869	0.1%	760,610
Okeechobee	1060	776,088,303	294,439,086	176,053,078	1,246,580,467	0.1%	732,159
Suwannee	884	755,475,288	287,723,345	168,365,600	1,211,564,234	0.1%	854,610
De Soto	678	656,029,756	304,388,631	139,529,973	1,099,948,360	0.1%	967,596
Taylor	583	660,133,590	269,184,676	150,633,120	1,079,951,386	0.1%	1,132,305
Bradford	602	664,564,604	228,227,123	137,022,168	1,029,813,894	0.1%	1,103,928
Gulf	579	620,922,146	189,505,417	127,860,530	938,288,093	0.1%	1,072,404
Washington	504	633,951,974	180,161,489	106,102,235	920,215,697	0.1%	1,257,841
Baker	466	592,961,509	194,785,586	100,457,302	888,204,397	0.1%	1,272,450
Wakulla	610	557,119,004	192,156,677	115,436,632	864,712,313	0.1%	913,310
Franklin	551	542,787,265	162,972,094	95,108,467	800,867,825	0.1%	985,095
Hardee	617	473,384,645	176,308,348	88,815,262	738,508,255	0.1%	767,236
Holmes	324	373,447,726	108,197,506	66,388,097	548,033,329	0.0%	1,152,616
Calhoun	325	338,291,922	122,937,035	73,339,700	534,568,657	0.0%	1,040,898
Madison	430	342,199,742	122,571,900	68,053,132	532,824,773	0.0%	795,813
Hamilton	267	328,285,707	121,798,720	76,528,776	526,613,203	0.0%	1,229,534
Jefferson	396	266,566,239	88,429,307	49,297,143	404,292,690	0.0%	673,147
Gilchrist	271	206,847,515	73,478,489	43,638,707	323,964,711	0.0%	763,275
Liberty	171	199,786,738	68,929,547	38,022,236	306,738,521	0.0%	1,168,343
Union	171	187,146,247	65,420,234	40,289,235	292,855,716	0.0%	1,094,422
Glades	139	108,463,508	42,599,786	20,859,424	171,922,718	0.0%	780,313
Dixie	164	96,908,818	39,251,269	23,890,932	160,051,019	0.0%	590,907
Lafayette	117	65,290,779	26,548,814	15,997,779	107,837,372	0.0%	558,041
Statewide	**431,208**	**815,184,285,117**	**300,212,610,283**	**181,985,712,243**	**1,297,382,607,642**	**100.0%**	**1,890,467**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	9,432	27,143,091,219	22.2%	2,877,766
Light Metal	1,311	2,909,442,106	2.4%	2,219,254
Other Concrete	2,874	4,953,345,575	4.0%	1,723,502
Reinforced Concrete	5,514	11,866,118,339	9.7%	2,151,998
Reinforced Masonry	4,205	10,371,374,298	8.5%	2,466,439
Steel Moment Resistant Frame - Distributed	9,748	23,431,914,408	19.2%	2,403,766
Steel Moment Resistant Frame - Perimeter	12,140	26,122,296,095	21.4%	2,151,754
Unreinforced Masonry	4,441	12,650,154,147	10.3%	2,848,492
Wood Frame	4,052	2,857,217,203	2.3%	705,138
County Total	**53,717**	**122,304,953,390**	**100.0%**	**2,276,839**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	991	1,740,254,501	1.4%	1,756,059
Air	305	1,898,472,505	1.6%	6,224,500
Construction	17	30,026,760	0.0%	1,766,280
Electrical	139	573,673,728	0.5%	4,127,149
Entertainment & Recreation	1,290	2,195,157,679	1.8%	1,701,673
General Commercial	7,410	12,035,747,639	9.8%	1,624,257
Government Services	3,714	10,666,169,982	8.7%	2,871,882
Health Care Services	3,218	9,623,619,366	7.9%	2,990,559
Heavy Fabrication & Assembly	817	3,263,380,678	2.7%	3,994,346
High Technology	249	1,280,156,888	1.0%	5,141,192
Highway	1,179	3,027,527,512	2.5%	2,567,877
Industrial Processing Facility	584	2,324,151,954	1.9%	3,979,712
Light Fabrication & Assembly	1,405	2,927,955,973	2.4%	2,083,954
Mining	58	120,299,855	0.1%	2,074,135
Parking	2,403	3,726,062,048	3.0%	1,550,588
Personal and Business Services	11,012	20,962,514,022	17.1%	1,903,606
Petroleum	24	84,584,677	0.1%	3,524,362
Retail Trade	17,027	26,738,225,657	21.9%	1,570,343
Sea & Inland Waterways	190	665,154,788	0.5%	3,500,815
Telephone and Telegraph	26	28,073,414	0.0%	1,079,747
Temporary Lodging	513	9,671,455,629	7.9%	18,852,740
University & College	1,016	8,317,404,542	6.8%	8,186,422
Wholesale Trade	130	404,883,595	0.3%	3,114,489
County Total	**53,717**	**122,304,953,390**	**100.0%**	**2,276,839**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	6,998	18,763,385,017	20.9%	2,681,250
Light Metal	1,234	2,288,544,576	2.6%	1,854,574
Other Concrete	2,946	4,509,329,879	5.0%	1,530,662
Reinforced Concrete	4,255	8,385,699,653	9.4%	1,970,787
Reinforced Masonry	3,350	7,481,786,108	8.4%	2,233,369
Steel Moment Resistant Frame - Distributed	7,462	15,588,914,618	17.4%	2,089,107
Steel Moment Resistant Frame - Perimeter	9,365	19,966,851,879	22.3%	2,132,072
Unreinforced Masonry	3,790	10,389,344,114	11.6%	2,741,252
Wood Frame	2,544	2,196,478,891	2.5%	863,396
County Total	**41,944**	**89,570,334,737**	**100.0%**	**2,135,474**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	1,190	2,172,913,729	2.4%	1,825,978
Air	103	734,697,741	0.8%	7,132,988
Construction	12	18,130,021	0.0%	1,510,835
Electrical	106	322,090,744	0.4%	3,038,592
Entertainment & Recreation	1,236	2,045,515,658	2.3%	1,654,948
General Commercial	6,084	10,382,596,395	11.6%	1,706,541
Government Services	2,425	5,774,274,755	6.4%	2,381,144
Health Care Services	2,446	6,328,425,362	7.1%	2,587,255
Heavy Fabrication & Assembly	592	2,727,524,751	3.0%	4,607,305
High Technology	210	984,976,106	1.1%	4,690,362
Highway	931	2,245,138,440	2.5%	2,411,534
Industrial Processing Facility	378	1,537,454,921	1.7%	4,067,341
Light Fabrication & Assembly	927	2,024,817,832	2.3%	2,184,270
Mining	22	65,651,715	0.1%	2,984,169
Parking	1,838	2,551,945,305	2.8%	1,388,436
Personal and Business Services	9,845	15,806,643,033	17.6%	1,605,550
Petroleum	23	94,782,828	0.1%	4,120,993
Retail Trade	11,914	21,688,295,678	24.2%	1,820,404
Sea & Inland Waterways	210	731,123,472	0.8%	3,481,540
Telephone and Telegraph	11	37,632,552	0.0%	3,421,141
Temporary Lodging	580	5,648,088,338	6.3%	9,738,083
University & College	732	5,252,339,855	5.9%	7,175,328
Wholesale Trade	129	395,275,505	0.4%	3,064,151
County Total	**41,944**	**89,570,334,737**	**100.0%**	**2,135,474**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	4,711	11,941,179,603	19.0%	2,534,744
Light Metal	995	2,424,627,976	3.9%	2,436,812
Other Concrete	1,601	2,696,153,738	4.3%	1,684,044
Reinforced Concrete	2,603	4,871,689,819	7.7%	1,871,567
Reinforced Masonry	2,507	4,802,483,411	7.6%	1,915,630
Steel Moment Resistant Frame - Distributed	4,987	11,649,886,550	18.5%	2,336,051
Steel Moment Resistant Frame - Perimeter	6,237	13,658,823,755	21.7%	2,189,967
Unreinforced Masonry	3,205	9,131,224,933	14.5%	2,849,056
Wood Frame	2,236	1,703,666,445	2.7%	761,926
County Total	**29,082**	**62,879,736,231**	**100.0%**	**2,162,153**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	1,333	2,644,549,880	4.2%	1,983,908
Air	25	203,366,557	0.3%	8,134,662
Construction	6	19,401,042	0.0%	3,233,507
Electrical	82	524,681,335	0.8%	6,398,553
Entertainment & Recreation	986	1,967,593,370	3.1%	1,995,531
General Commercial	4,636	7,385,865,090	11.7%	1,593,155
Government Services	1,770	4,364,119,444	6.9%	2,465,604
Health Care Services	1,600	4,345,203,703	6.9%	2,715,752
Heavy Fabrication & Assembly	320	1,347,123,660	2.1%	4,209,761
High Technology	114	848,835,957	1.3%	7,445,929
Highway	741	1,425,488,593	2.3%	1,923,736
Industrial Processing Facility	223	1,302,434,007	2.1%	5,840,511
Light Fabrication & Assembly	540	1,217,714,910	1.9%	2,255,028
Mining	13	20,322,257	0.0%	1,563,251
Parking	1,047	1,391,862,042	2.2%	1,329,381
Personal and Business Services	7,207	10,120,592,621	16.1%	1,404,273
Petroleum	10	133,488,004	0.2%	13,348,800
Retail Trade	7,430	15,743,127,852	25.0%	2,118,860
Sea & Inland Waterways	138	422,582,812	0.7%	3,062,194
Telephone and Telegraph	7	4,021,582	0.0%	574,512
Temporary Lodging	258	3,163,171,971	5.0%	12,260,356
University & College	532	3,974,181,280	6.3%	7,470,266
Wholesale Trade	64	310,008,263	0.5%	4,843,879
County Total	**29,082**	**62,879,736,231**	**100.0%**	**2,162,153**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	3,895	14,083,401,533	19.2%	3,615,764
Light Metal	1,585	3,137,971,367	4.3%	1,979,793
Other Concrete	1,518	2,663,598,661	3.6%	1,754,676
Reinforced Concrete	1,916	7,406,592,672	10.1%	3,865,654
Reinforced Masonry	2,412	5,697,362,827	7.8%	2,362,091
Steel Moment Resistant Frame - Distributed	4,085	10,291,144,360	14.0%	2,519,252
Steel Moment Resistant Frame - Perimeter	5,259	17,302,983,423	23.6%	3,290,166
Unreinforced Masonry	4,739	10,486,113,108	14.3%	2,212,727
Wood Frame	2,885	2,277,310,719	3.1%	789,362
County Total	**28,294**	**73,346,478,670**	**100.0%**	**2,592,298**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	937	2,260,735,422	3.1%	2,412,738
Air	76	473,158,461	0.6%	6,225,769
Construction	3	1,556,065	0.0%	518,688
Electrical	100	354,398,605	0.5%	3,543,986
Entertainment & Recreation	909	1,941,901,703	2.6%	2,136,306
General Commercial	4,179	6,496,520,037	8.9%	1,554,563
Government Services	2,061	4,411,954,935	6.0%	2,140,687
Health Care Services	1,489	5,291,048,732	7.2%	3,553,424
Heavy Fabrication & Assembly	329	1,886,444,526	2.6%	5,733,874
High Technology	112	422,780,078	0.6%	3,774,822
Highway	829	2,535,079,498	3.5%	3,057,997
Industrial Processing Facility	222	820,408,471	1.1%	3,695,534
Light Fabrication & Assembly	603	1,410,324,590	1.9%	2,338,847
Mining	14	16,982,285	0.0%	1,213,020
Parking	1,286	1,872,940,903	2.6%	1,456,408
Personal and Business Services	6,501	10,995,270,204	15.0%	1,691,320
Petroleum	12	33,948,920	0.0%	2,829,077
Retail Trade	7,524	13,829,611,655	18.9%	1,838,066
Sea & Inland Waterways	34	94,512,929	0.1%	2,779,792
Telephone and Telegraph	5	7,701,362	0.0%	1,540,272
Temporary Lodging	449	13,299,571,087	18.1%	29,620,426
University & College	581	4,674,644,000	6.4%	8,045,859
Wholesale Trade	39	214,984,204	0.3%	5,512,415
County Total	**28,294**	**73,346,478,670**	**100.0%**	**2,592,298**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	3,545	10,573,727,182	19.5%	2,982,716
Light Metal	1,237	2,100,601,906	3.9%	1,698,142
Other Concrete	1,509	2,333,816,162	4.3%	1,546,598
Reinforced Concrete	1,738	5,050,469,697	9.3%	2,905,909
Reinforced Masonry	2,035	4,069,245,304	7.5%	1,999,629
Steel Moment Resistant Frame - Distributed	3,719	9,862,735,324	18.2%	2,651,986
Steel Moment Resistant Frame - Perimeter	4,662	10,312,738,185	19.1%	2,212,085
Unreinforced Masonry	4,164	7,623,586,646	14.1%	1,830,833
Wood Frame	3,191	2,184,681,102	4.0%	684,638
County Total	**25,800**	**54,111,601,506**	**100.0%**	**2,097,349**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	760	1,502,375,355	2.8%	1,976,810
Air	27	388,540,055	0.7%	14,390,372
Construction	15	43,624,209	0.1%	2,908,281
Electrical	76	295,145,755	0.5%	3,883,497
Entertainment & Recreation	748	1,192,636,361	2.2%	1,594,434
General Commercial	3,990	5,596,974,304	10.3%	1,402,750
Government Services	1,698	2,897,549,069	5.4%	1,706,448
Health Care Services	1,689	4,994,625,099	9.2%	2,957,149
Heavy Fabrication & Assembly	379	1,955,309,354	3.6%	5,159,128
High Technology	90	390,167,048	0.7%	4,335,189
Highway	554	1,383,578,632	2.6%	2,497,434
Industrial Processing Facility	292	1,231,671,953	2.3%	4,218,055
Light Fabrication & Assembly	449	1,197,353,583	2.2%	2,666,712
Mining	11	20,936,012	0.0%	1,903,274
Parking	1,075	1,355,615,482	2.5%	1,261,038
Personal and Business Services	5,841	10,230,484,404	18.9%	1,751,495
Petroleum	19	58,865,071	0.1%	3,098,162
Retail Trade	7,204	12,716,868,551	23.5%	1,765,251
Sea & Inland Waterways	69	257,160,645	0.5%	3,726,966
Telephone and Telegraph	3	1,345,584	0.0%	448,528
Temporary Lodging	227	2,325,197,474	4.3%	10,243,161
University & College	514	3,843,416,111	7.1%	7,477,463
Wholesale Trade	70	232,161,395	0.4%	3,316,591
County Total	**25,800**	**54,111,601,506**	**100.0%**	**2,097,349**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	3,058	8,607,788,756	19.2%	2,814,843
Light Metal	972	1,529,533,803	3.4%	1,573,594
Other Concrete	1,222	1,834,876,033	4.1%	1,501,535
Reinforced Concrete	1,514	4,288,657,951	9.6%	2,832,667
Reinforced Masonry	1,873	3,388,006,847	7.6%	1,808,866
Steel Moment Resistant Frame - Distributed	3,239	6,564,241,329	14.6%	2,026,626
Steel Moment Resistant Frame - Perimeter	4,025	9,533,772,895	21.3%	2,368,639
Unreinforced Masonry	3,706	7,143,331,851	15.9%	1,927,505
Wood Frame	2,762	1,961,057,883	4.4%	710,014
County Total	**22,371**	**44,851,267,347**	**100.0%**	**2,004,884**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	763	1,221,455,194	2.7%	1,600,859
Air	19	131,335,023	0.3%	6,912,370
Construction	11	10,804,665	0.0%	982,242
Electrical	46	184,856,449	0.4%	4,018,618
Entertainment & Recreation	716	1,025,792,275	2.3%	1,432,671
General Commercial	3,367	5,424,388,796	12.1%	1,611,045
Government Services	1,170	3,275,263,076	7.3%	2,799,370
Health Care Services	1,629	3,790,780,268	8.5%	2,327,060
Heavy Fabrication & Assembly	434	1,792,991,989	4.0%	4,131,318
High Technology	173	1,463,017,781	3.3%	**8,456,750**
Highway	416	976,890,227	2.2%	2,348,294
Industrial Processing Facility	224	843,860,337	1.9%	3,767,234
Light Fabrication & Assembly	479	823,613,166	1.8%	1,719,443
Mining	5	1,907,092	0.0%	381,418
Parking	933	1,130,874,531	2.5%	1,212,084
Personal and Business Services	4,938	6,712,905,794	15.0%	1,359,438
Petroleum	8	12,425,854	0.0%	1,553,232
Retail Trade	6,006	10,041,877,990	22.4%	1,671,974
Sea & Inland Waterways	143	286,325,166	0.6%	2,002,274
Telephone and Telegraph	3	29,648,532	0.1%	9,882,844
Temporary Lodging	434	2,784,639,517	6.2%	6,416,220
University & College	391	2,774,548,618	6.2%	7,096,032
Wholesale Trade	63	111,065,008	0.2%	1,762,937
County Total	**22,371**	**44,851,267,347**	**100.0%**	**2,004,884**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	2,552	9,102,504,679	23.1%	3,566,812
Light Metal	691	1,744,430,734	4.4%	2,524,502
Other Concrete	1,021	1,489,259,018	3.8%	1,458,628
Reinforced Concrete	1,132	2,636,263,626	6.7%	2,328,855
Reinforced Masonry	1,390	3,122,447,917	7.9%	2,246,365
Steel Moment Resistant Frame - Distributed	2,553	6,140,257,559	15.6%	2,405,115
Steel Moment Resistant Frame - Perimeter	3,118	7,176,583,323	18.2%	2,301,662
Unreinforced Masonry	2,447	5,764,031,927	14.6%	2,355,550
Wood Frame	3,094	2,250,392,825	5.7%	727,341
County Total	**17,998**	**39,426,171,608**	**100.0%**	**2,190,586**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	707	1,097,351,057	2.8%	1,552,123
Air	20	81,556,264	0.2%	4,077,813
Construction	9	23,989,621	0.1%	2,665,513
Electrical	43	70,780,793	0.2%	1,646,065
Entertainment & Recreation	478	758,177,071	1.9%	1,586,144
General Commercial	2,560	4,408,309,738	11.2%	1,721,996
Government Services	1,673	3,671,067,154	9.3%	2,194,302
Health Care Services	977	3,227,166,475	8.2%	3,303,139
Heavy Fabrication & Assembly	330	1,839,375,447	4.7%	5,573,865
High Technology	67	233,067,191	0.6%	3,478,615
Highway	542	1,741,369,871	4.4%	3,212,860
Industrial Processing Facility	181	928,290,125	2.4%	5,128,675
Light Fabrication & Assembly	351	782,440,786	2.0%	2,229,176
Mining	9	12,252,421	0.0%	1,361,380
Parking	832	964,784,000	2.4%	1,159,596
Personal and Business Services	3,747	6,776,906,825	17.2%	1,808,622
Petroleum	16	45,940,259	0.1%	2,871,266
Retail Trade	4,768	8,891,237,437	22.6%	1,864,773
Sea & Inland Waterways	66	212,340,339	0.5%	3,217,278
Telephone and Telegraph	2	805,473	0.0%	402,736
Temporary Lodging	158	992,513,859	2.5%	6,281,733
University & College	411	2,552,794,692	6.5%	6,211,179
Wholesale Trade	51	113,654,709	0.3%	2,228,524
County Total	**17,998**	**39,426,171,608**	**100.0%**	**2,190,586**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	807	3,659,380,639	20.6%	4,534,548
Light Metal	373	823,905,377	4.6%	2,208,862
Other Concrete	248	434,414,898	2.4%	1,751,673
Reinforced Concrete	245	1,611,948,970	9.1%	6,579,384
Reinforced Masonry	520	1,600,074,406	9.0%	3,077,066
Steel Moment Resistant Frame - Distributed	737	2,194,696,302	12.4%	2,977,878
Steel Moment Resistant Frame - Perimeter	936	2,742,298,586	15.4%	2,929,806
Unreinforced Masonry	1,212	3,289,529,606	18.5%	2,714,133
Wood Frame	2,356	1,411,285,929	7.9%	599,018
County Total	**7,434**	**17,767,534,712**	**100.0%**	**2,390,037**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	350	532,323,752	3.0%	1,520,925
Air	13	63,143,578	0.4%	4,857,198
Construction	2	2,372,779	0.0%	1,186,390
Electrical	46	177,585,551	1.0%	3,860,555
Entertainment & Recreation	210	747,823,711	4.2%	3,561,065
General Commercial	1,003	1,439,641,498	8.1%	1,435,335
Government Services	688	1,271,669,341	7.2%	1,848,357
Health Care Services	399	2,490,653,519	14.0%	6,242,239
Heavy Fabrication & Assembly	122	797,744,058	4.5%	6,538,886
High Technology	23	29,734,315	0.2%	1,292,796
Highway	179	428,646,955	2.4%	2,394,676
Industrial Processing Facility	74	684,638,928	3.9%	9,251,877
Light Fabrication & Assembly	165	254,951,262	1.4%	1,545,159
Mining	4	2,753,490	0.0%	688,372
Parking	345	431,738,381	2.4%	1,251,416
Personal and Business Services	1,525	2,214,284,436	12.5%	1,451,990
Petroleum	6	21,191,097	0.1%	3,531,849
Retail Trade	1,991	4,015,158,876	22.6%	2,016,654
Sea & Inland Waterways	44	93,749,105	0.5%	2,130,661
Telephone and Telegraph	1	1,893,220	0.0%	1,893,220
Temporary Lodging	83	619,403,578	3.5%	7,462,694
University & College	142	1,395,733,674	7.9%	9,829,110
Wholesale Trade	19	50,699,607	0.3%	2,668,400
County Total	**7,434**	**17,767,534,712**	**100.0%**	**2,390,037**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	1,960	4,355,629,805	18.5%	2,222,260
Light Metal	650	1,154,169,607	4.9%	1,775,646
Other Concrete	725	1,047,828,530	4.4%	1,445,281
Reinforced Concrete	883	1,498,597,426	6.4%	1,697,166
Reinforced Masonry	1,218	2,082,034,658	8.8%	1,709,388
Steel	5	5,624,585	0.0%	1,124,917
Steel Moment Resistant Frame - Distributed	1,905	4,221,311,320	17.9%	2,215,911
Steel Moment Resistant Frame - Perimeter	2,443	4,157,646,232	17.6%	1,701,861
Unreinforced Masonry	1,948	4,028,084,509	17.1%	2,067,805
Wood Frame	1,258	1,005,666,044	4.3%	799,417
County Total	**12,995**	**23,556,592,715**	**100.0%**	**1,812,743**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	673	999,345,188	4.2%	1,484,911
Air	12	103,817,806	0.4%	8,651,484
Construction	7	12,269,303	0.1%	1,752,758
Electrical	59	175,948,336	0.7%	2,982,175
Entertainment & Recreation	508	783,362,864	3.3%	1,542,053
General Commercial	2,180	2,137,684,251	9.1%	980,589
Government Services	805	1,452,014,192	6.2%	1,803,744
Health Care Services	630	2,260,346,681	9.6%	3,587,852
Heavy Fabrication & Assembly	153	453,975,810	1.9%	2,967,162
High Technology	34	98,426,330	0.4%	2,894,892
Highway	373	429,286,775	1.8%	1,150,903
Industrial Processing Facility	86	250,418,295	1.1%	2,911,841
Light Fabrication & Assembly	210	364,191,956	1.5%	1,734,247
Mining	11	14,144,335	0.1%	1,285,849
Parking	565	757,864,695	3.2%	1,341,353
Personal and Business Services	2,727	3,091,621,406	13.1%	1,133,708
Petroleum	5	13,211,307	0.1%	2,642,261
Retail Trade	3,320	6,602,509,926	28.0%	1,988,708
Sea & Inland Waterways	129	216,131,730	0.9%	1,675,440
Telephone and Telegraph	1	1,371,515	0.0%	1,371,515
Temporary Lodging	271	1,944,483,034	8.3%	7,175,214
University & College	192	1,291,844,049	5.5%	6,728,354
Wholesale Trade	44	102,322,931	0.4%	2,325,521
County Total	**12,995**	**23,556,592,715**	**100.0%**	**1,812,743**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	1,225	2,151,259,919	13.9%	1,756,131
Light Metal	468	971,654,166	6.3%	2,076,184
Other Concrete	474	632,412,258	4.1%	1,334,203
Reinforced Concrete	678	1,842,125,695	11.9%	2,717,000
Reinforced Masonry	740	1,297,475,563	8.4%	1,753,345
Steel Moment Resistant Frame - Distributed	1,278	2,189,905,542	14.1%	1,713,541
Steel Moment Resistant Frame - Perimeter	1,615	2,624,089,269	16.9%	1,624,823
Unreinforced Masonry	1,252	2,792,548,827	18.0%	2,230,470
Wood Frame	1,484	993,058,758	6.4%	669,177
County Total	**9,214**	**15,494,529,996**	**100.0%**	**1,681,629**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	459	770,846,318	5.0%	1,679,404
Air	16	37,907,492	0.2%	2,369,218
Construction	1	309,568	0.0%	309,568
Electrical	37	86,921,130	0.6%	2,349,220
Entertainment & Recreation	445	853,352,412	5.5%	1,917,646
General Commercial	1,643	1,636,617,662	10.6%	996,115
Government Services	479	703,776,705	4.5%	1,469,262
Health Care Services	420	1,189,709,438	7.7%	2,832,642
Heavy Fabrication & Assembly	74	193,595,388	1.2%	2,616,154
High Technology	19	79,249,099	0.5%	4,171,005
Highway	208	374,392,273	2.4%	1,799,963
Industrial Processing Facility	39	100,798,071	0.7%	2,584,566
Light Fabrication & Assembly	150	236,623,069	1.5%	1,577,487
Mining	9	8,029,136	0.1%	892,126
Parking	281	276,101,504	1.8%	982,568
Personal and Business Services	2,119	1,917,281,671	12.4%	904,805
Retail Trade	2,446	4,101,819,079	26.5%	1,676,950
Sea & Inland Waterways	89	197,835,275	1.3%	2,222,868
Telephone and Telegraph	3	1,853,626	0.0%	617,875
Temporary Lodging	131	1,945,996,319	12.6%	14,854,934
University & College	127	739,417,259	4.8%	5,822,183
Wholesale Trade	19	42,097,502	0.3%	2,215,658
County Total	**9,214**	**15,494,529,996**	**100.0%**	**1,681,629**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	1,342	3,304,867,477	17.7%	2,462,643
Light Metal	880	1,299,199,185	7.0%	1,476,363
Other Concrete	490	613,631,597	3.3%	1,252,309
Reinforced Concrete	512	988,915,533	5.3%	1,931,476
Reinforced Masonry	1,179	2,048,888,867	11.0%	1,737,819
Steel Moment Resistant Frame - Distributed	1,411	2,663,515,582	14.3%	1,887,679
Steel Moment Resistant Frame - Perimeter	1,752	2,705,343,347	14.5%	1,544,146
Unreinforced Masonry	3,112	3,904,354,002	20.9%	1,254,612
Wood Frame	1,634	1,156,801,723	6.2%	707,957
County Total	**12,312**	**18,685,517,314**	**100.0%**	**1,517,667**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	606	576,697,962	3.1%	951646.8026
Air	24	31,410,056	0.2%	1,308,752
Construction	3	1,114,117	0.0%	371,372
Electrical	40	108,289,085	0.6%	2,707,227
Entertainment & Recreation	392	665,980,412	3.6%	1,698,930
General Commercial	1,772	1,497,352,021	8.0%	845,007
Government Services	857	1,162,566,081	6.2%	1,356,553
Health Care Services	697	1,348,383,522	7.2%	1,934,553
Heavy Fabrication & Assembly	163	534,115,270	2.9%	3,276,781
High Technology	42	329,113,994	1.8%	7,836,047
Highway	232	532,906,393	2.9%	2,297,010
Industrial Processing Facility	82	239,925,706	1.3%	2,925,923
Light Fabrication & Assembly	258	356,786,428	1.9%	1,382,893
Mining	3	2,831,633	0.0%	943,878
Parking	561	481,682,985	2.6%	858,615
Personal and Business Services	2,470	2,039,631,318	10.9%	825,762
Petroleum	3	3,137,363	0.0%	1,045,788
Retail Trade	3,504	4,960,498,625	26.5%	1,415,667
Sea & Inland Waterways	51	58,537,182	0.3%	1,147,788
Telephone and Telegraph	1	459,990	0.0%	459,990
Temporary Lodging	332	2,223,080,287	11.9%	6,696,025
University & College	193	1,485,533,824	8.0%	7,697,066
Wholesale Trade	26	45,483,059	0.2%	1,749,348
County Total	**12,312**	**18,685,517,314**	**100.0%**	**1,517,667**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	1,669	4,202,595,592	20.7%	2,518,032
Light Metal	599	1,034,004,958	5.1%	1,726,219
Other Concrete	706	973,778,071	4.8%	1,379,289
Reinforced Concrete	808	1,266,495,366	6.2%	1,567,445
Reinforced Masonry	1,036	1,848,565,297	9.1%	1,784,329
Steel Moment Resistant Frame - Distributed	1,766	2,668,089,084	13.1%	1,510,809
Steel Moment Resistant Frame - Perimeter	2,121	3,746,852,632	18.4%	1,766,550
Unreinforced Masonry	1,769	3,623,558,896	17.8%	2,048,366
Wood Frame	1,512	956,439,071	4.7%	632,566
County Total	**11,986**	**20,320,378,967**	**100.0%**	**1,695,343**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	663	750,821,072	3.7%	1,132,460
Air	15	60,180,279	0.3%	4,012,019
Construction	2	10,599,409	0.1%	5,299,705
Electrical	46	127,749,505	0.6%	2,777,163
Entertainment & Recreation	404	573,549,081	2.8%	1,419,676
General Commercial	1,710	1,634,617,298	8.0%	955,917
Government Services	798	1,150,543,385	5.7%	1,441,784
Health Care Services	688	1,727,648,579	8.5%	2,511,117
Heavy Fabrication & Assembly	191	763,289,084	3.8%	3,996,278
High Technology	82	533,437,931	2.6%	6,505,341
Highway	273	520,250,152	2.6%	1,905,678
Industrial Processing Facility	97	292,618,672	1.4%	3,016,687
Light Fabrication & Assembly	203	230,200,190	1.1%	1,133,991
Mining	2	1,514,316	0.0%	757,158
Parking	516	548,537,773	2.7%	1,063,058
Personal and Business Services	2,450	2,597,309,177	12.8%	1,060,126
Petroleum	3	6,103,359	0.0%	2,034,453
Retail Trade	3,317	5,883,258,394	29.0%	1,773,668
Sea & Inland Waterways	74	134,031,121	0.7%	1,811,231
Telephone and Telegraph	3	1,376,343	0.0%	458,781
Temporary Lodging	170	1,135,179,868	5.6%	6,677,529
University & College	246	1,567,534,784	7.7%	6,372,093
Wholesale Trade	33	70,029,194	0.3%	2,122,097
County Total	**11,986**	**20,320,378,967**	**100.0%**	**1,695,343**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	1,689	3,795,080,053	20.5%	2,246,939
Light Metal	490	833,788,644	4.5%	1,701,609
Other Concrete	700	735,368,705	4.0%	1,050,527
Reinforced Concrete	951	1,428,017,776	7.7%	1,501,596
Reinforced Masonry	971	1,709,984,712	9.2%	1,761,055
Steel Moment Resistant Frame - Distributed	1,788	2,497,917,366	13.5%	1,397,046
Steel Moment Resistant Frame - Perimeter	2,183	3,570,378,548	19.3%	1,635,538
Unreinforced Masonry	1,607	3,133,068,370	16.9%	1,949,638
Wood Frame	1,001	805,548,995	4.4%	804,744
County Total	**11,380**	**18,509,153,168**	**100.0%**	**1,626,463**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	523	813,008,511	4.4%	1,554,510
Air	10	29,553,032	0.2%	2,955,303
Construction	4	3,190,094	0.0%	797,524
Electrical	37	73,839,588	0.4%	1,995,665
Entertainment & Recreation	362	486,795,535	2.6%	1,344,739
General Commercial	1,853	1,838,922,297	9.9%	992,403
Government Services	649	967,267,879	5.2%	1,490,397
Health Care Services	764	2,030,523,513	11.0%	2,657,753
Heavy Fabrication & Assembly	170	476,918,008	2.6%	2,805,400
High Technology	33	74,139,574	0.4%	2,246,654
Highway	210	337,843,839	1.8%	1,608,780
Industrial Processing Facility	91	482,789,703	2.6%	5,305,381
Light Fabrication & Assembly	235	313,757,451	1.7%	1,335,138
Mining	6	4,281,462	0.0%	713,577
Parking	396	393,296,244	2.1%	993,172
Personal and Business Services	2,619	2,730,813,801	14.8%	1,042,693
Petroleum	2	24,264,030	0.1%	12,132,015
Retail Trade	2,983	5,216,694,689	28.2%	1,748,808
Sea & Inland Waterways	59	72,843,672	0.4%	1,234,639
Telephone and Telegraph	1	527,434	0.0%	527,434
Temporary Lodging	185	1,281,554,836	6.9%	6,927,323
University & College	153	799,535,756	4.3%	5,225,724
Wholesale Trade	35	56,792,219	0.3%	1,622,635
County Total	**11,380**	**18,509,153,168**	**100.0%**	**1,626,463**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	836	2,426,845,042	15.4%	2,902,925
Light Metal	324	645,756,270	4.1%	1,993,075
Other Concrete	277	557,237,330	3.5%	2,011,687
Reinforced Concrete	370	1,005,063,729	6.4%	2,716,388
Reinforced Masonry	567	1,253,598,034	8.0%	2,210,931
Steel Moment Resistant Frame - Distributed	876	3,212,185,571	20.4%	3,666,879
Steel Moment Resistant Frame - Perimeter	1,053	2,744,284,090	17.4%	2,606,158
Unreinforced Masonry	1,133	2,958,381,946	18.8%	2,611,105
Wood Frame	1,393	958,151,535	6.1%	687,833
County Total	**6,829**	**15,761,503,547**	**100.0%**	**2,308,025**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	285	473,912,831	3.0%	1,662,852
Air	9	115,446,402	0.7%	12,827,378
Construction	5	8,556,553	0.1%	1,711,311
Electrical	21	72,455,606	0.5%	3,450,267
Entertainment & Recreation	196	1,073,546,332	6.8%	5,477,277
General Commercial	1,049	1,488,041,632	9.4%	1,418,533
Government Services	660	1,401,217,112	8.9%	2,123,056
Health Care Services	402	1,191,422,829	7.6%	2,963,738
Heavy Fabrication & Assembly	48	180,602,740	1.1%	3,762,557
High Technology	24	70,479,708	0.4%	2,936,654
Highway	125	297,839,224	1.9%	2,382,714
Industrial Processing Facility	29	138,920,191	0.9%	4,790,351
Light Fabrication & Assembly	132	379,772,937	2.4%	2,877,068
Mining	2	2,562,423	0.0%	1,281,212
Parking	289	408,324,498	2.6%	1,412,888
Personal and Business Services	1,743	2,282,373,268	14.5%	1,309,451
Petroleum	3	1,086,833	0.0%	362,278
Retail Trade	1,548	3,693,794,152	23.4%	2,386,172
Sea & Inland Waterways	5	3,322,067	0.0%	664,413
Telephone and Telegraph	1	1,368,079	0.0%	1,368,079
Temporary Lodging	79	435,592,551	2.8%	5,513,830
University & College	160	2,022,049,698	12.8%	12,637,811
Wholesale Trade	14	18,815,879	0.1%	1,343,991
County Total	**6,829**	**15,761,503,547**	**100.0%**	**2,308,025**

Construction	Risks	Structure Value	% of Total	Avg Structure Value
Braced Steel Frame	1,315	2,944,053,920	17.6%	2,238,824
Light Metal	464	616,573,891	3.7%	1,328,823
Other Concrete	536	776,996,212	4.6%	1,449,620
Reinforced Concrete	680	1,236,256,328	7.4%	1,818,024
Reinforced Masonry	814	1,473,655,276	8.8%	1,810,387
Steel Moment Resistant Frame - Distributed	1,486	2,839,482,456	16.9%	1,910,823
Steel Moment Resistant Frame - Perimeter	1,858	3,286,803,628	19.6%	1,769,001
Unreinforced Masonry	1,620	2,739,978,995	16.3%	1,691,345
Wood Frame	1,052	847,295,780	5.1%	805,414
County Total	**9,825**	**16,761,096,486**	**100.0%**	**1,705,964**

Occupancy	Risks	Structure Value	% of Total	Avg Structure Value
Agriculture	389	622,173,832	3.7%	1,599,419
Air	15	72,654,681	0.4%	4,843,645
Construction	2	1,732,484	0.0%	866,242
Electrical	32	67,606,426	0.4%	2,112,701
Entertainment & Recreation	288	551,831,340	3.3%	1,916,081
General Commercial	1,552	2,139,094,973	12.8%	1,378,283
Government Services	665	1,210,401,509	7.2%	1,820,153
Health Care Services	515	1,013,982,594	6.0%	1,968,898
Heavy Fabrication & Assembly	122	496,060,494	3.0%	4,066,070
High Technology	58	166,643,401	1.0%	2,873,162
Highway	184	228,880,736	1.4%	1,243,917
Industrial Processing Facility	77	259,213,856	1.5%	3,366,414
Light Fabrication & Assembly	250	399,055,156	2.4%	1,596,221
Mining	4	4,826,486	0.0%	1,206,621
Parking	372	438,289,643	2.6%	1,178,198
Personal and Business Services	2,321	2,356,582,587	14.1%	1,015,331
Petroleum	4	10,933,718	0.1%	2,733,430
Retail Trade	2,692	4,892,286,234	29.2%	1,817,343
Sea & Inland Waterways	8	8,793,453	0.1%	1,099,182
Telephone and Telegraph	2	13,593,791	0.1%	6,796,895
Temporary Lodging	69	745,571,506	4.4%	10,805,384
University & College	178	1,046,817,445	6.2%	5,880,997
Wholesale Trade	26	14,070,142	0.1%	541,159
County Total	**9,825**	**16,761,096,486**	**100.0%**	**1,705,964**

Tropical Cyclone and Storm Surge
Summary of Statewide Aggregate and Occurrence Exceedance Probabilities
(in USD)

Tropical Cyclone

	Aggregate Distribution							
	Average Annual Loss	**Standard Deviation**	**5%**	**2%**	**1%**	**0.4%**	**0.2%**	**0.1%**
Ground up Loss	1,864,013,693	6,895,156,464	9,029,679,292	20,456,482,477	33,642,927,026	50,898,528,376	72,384,309,517	88,399,294,256
Gross Loss	1,762,241,174	6,417,596,068	8,552,468,490	19,469,060,147	31,660,001,348	47,460,233,983	67,269,311,925	82,023,834,461

	Occurrence Distribution							
Occurrence	**Average Annual Loss**	**Standard Deviation**	**5%**	**2%**	**1%**	**0.4%**	**0.2%**	**0.1%**
Ground up Loss	1,721,712,179	6,543,163,274	8,156,893,648	18,467,742,219	28,260,305,150	47,903,434,257	64,649,298,372	86,643,996,510
Gross Loss	1,630,236,229	6,093,524,404	7,769,622,647	17,520,917,750	27,005,455,502	44,510,821,816	60,138,968,232	80,469,839,192

Storm Surge

	Aggregate Distribution							
	Average Annual Loss	**Standard Deviation**	**5%**	**2%**	**1%**	**0.4%**	**0.2%**	**0.1%**
Ground up Loss	243,967,025	1,218,890,971	1,010,702,853	3,005,230,009	5,518,138,240	10,193,499,556	12,825,315,161	17,069,074,037
Gross Loss	231,094,708	1,130,951,156	986,367,590	2,867,594,131	5,047,269,419	9,582,792,827	11,758,604,472	15,771,109,469

	Occurrence Distribution							
	Average Annual Loss	**Standard Deviation**	**5%**	**2%**	**1%**	**0.4%**	**0.2%**	**0.1%**
Ground up Loss	235,293,748	1,193,814,498	970,358,831	2,897,807,900	5,266,990,641	9,933,720,293	12,184,290,274	17,028,377,622
Gross Loss	222,858,157	1,107,728,031	931,628,202	2,805,006,197	4,968,193,246	9,084,230,241	11,635,252,011	15,538,700,455

Tropical Cyclone and Storm Surge
Exceedance Probabilities Statewide and Selected Counties
(Aggregate Ground Up Losses in USD)

Statewide

Peril	0.4%	1%	5%
Tropical Cyclone	50,898,528,376	33,642,927,026	9,029,679,292
Storm Surge	10,193,499,556	5,518,138,240	1,010,702,853

Selected counties - Tropical Cyclone
(Based on each county's aggregate curve)

County	0.4%	1%	5%
Miami-Dade	22,065,653,982	13,388,054,323	2,268,050,477
Broward	15,712,658,252	7,463,849,232	1,410,521,558
Palm Beach	10,280,891,363	5,714,116,622	1,214,938,504
Orange	1,619,124,462	853,798,768	150,498,874
Hillsborough	1,712,722,335	835,504,619	118,746,136
Pinellas	4,340,430,982	1,599,649,236	182,033,185
Duval	530,681,773	248,105,524	26,620,957
Escambia	1,023,784,190	489,296,727	81,186,478
Lee	1,979,263,760	959,215,243	170,093,906
Collier	2,539,895,869	1,306,492,686	224,610,559
Volusia	993,900,381	539,053,178	85,604,418
Brevard	1,324,962,581	646,342,344	122,724,414
Sarasota	2,437,048,996	875,065,242	126,636,304
Leon	202,874,181	103,704,687	10,393,313
Seminole	305,835,984	190,906,099	29,225,738

Selected counties - Storm Surge
(Based on each county's aggregate curve)

County	0.4%	1%	5%
Miami-Dade	1,530,027,002	524,735,416	24,214,637
Broward	532,499,353	198,138,445	6,765,621
Palm Beach	225,725,854	116,214,416	10,601,678
Orange	*	*	*
Hillsborough	182,853,006	33,954,126	0
Pinellas	584,076,732	176,674,417	0
Duval	112,977	0	0
Escambia	22,469,963	6,084,441	30,358
Lee	4,047,025,222	1,365,838,811	2,847,921
Collier	5,061,108,996	1,592,825,090	11,400,316
Volusia	17,058,834	814,091	0
Brevard	44,226,714	14,164,741	12,401
Sarasota	930,674,521	209,988,893	0
Leon	*	*	*
Seminole	*	*	*

* There are no county level Storm Surge losses.

Distribution of Loss Costs by County and Coverage
Tropical Cyclone
(per 1,000 of Expoure)

County	Structure	Contents	Time Element	Total Loss Costs
Alachua	0.3284	0.0751	0.2440	0.2619
Baker	0.4901	0.1045	0.3352	0.3880
Bay	1.2467	0.3542	0.9065	1.0122
Bradford	0.5160	0.1022	0.3453	0.4016
Brevard	1.1622	0.2992	0.7969	0.9056
Broward	3.0657	0.9202	2.3911	2.4586
Calhoun	0.6556	0.1591	0.3971	0.5060
Charlotte	2.0782	0.6742	1.5016	1.6681
Citrus	0.8101	0.2219	0.6023	0.6433
Clay	0.2583	0.0503	0.1668	0.1963
Collier	2.9941	1.1089	2.3235	2.4878
Columbia	0.3035	0.0605	0.1976	0.2327
De Soto	0.8453	0.1683	0.5270	0.6176
Dixie	0.5438	0.1075	0.3570	0.4089
Duval	0.2294	0.0471	0.1617	0.1755
Escambia	0.9984	0.2736	0.6822	0.7913
Flagler	0.9862	0.2875	0.6796	0.7745
Franklin	1.8452	0.6800	1.4055	1.5559
Gadsden	0.3875	0.0924	0.2613	0.3039
Gilchrist	0.3397	0.0637	0.2239	0.2615
Glades	1.5376	0.3029	1.0273	1.1697
Gulf	2.5139	0.9897	1.8867	2.1206
Hamilton	0.2350	0.0434	0.1609	0.1799
Hardee	0.6673	0.1228	0.4151	0.5070
Hendry	1.1941	0.2685	0.7404	0.8711
Hernando	0.6897	0.1597	0.4790	0.5371
Highlands	0.7305	0.1512	0.4665	0.5566
Hillsborough	0.5572	0.1223	0.3811	0.4281
Holmes	0.5978	0.1330	0.4119	0.4836
Indian River	2.2996	0.6633	1.6376	1.8198
Jackson	0.4214	0.0880	0.2690	0.3305
Jefferson	0.2871	0.0685	0.1823	0.2265
Lafayette	0.3431	0.0648	0.1945	0.2526
Lake	0.3855	0.0735	0.2418	0.2913
Lee	1.4999	0.4161	1.0654	1.1902
Leon	0.2297	0.0548	0.1577	0.1821
Levy	0.6582	0.1469	0.4336	0.5119
Liberty	0.5456	0.1129	0.3446	0.4235
Madison	0.2166	0.0424	0.1438	0.1672
Manatee	1.5552	0.4860	1.2308	1.2516
Marion	0.4314	0.0878	0.2902	0.3254
Martin	2.3974	0.6716	1.7265	1.8775
Miami-Dade	3.5511	1.0800	2.6836	2.8542
Monroe	6.7806	3.2006	6.0398	5.9922
Nassau	0.3952	0.1131	0.2868	0.3205
Okaloosa	1.6256	0.5647	1.2186	1.3421
Okeechobee	1.2643	0.2585	0.7930	0.9602
Orange	0.4237	0.0824	0.2840	0.3302
Osceola	0.4497	0.0911	0.3202	0.3667
Palm Beach	3.3220	1.0223	2.5659	2.6738
Pasco	1.0528	0.3038	0.7834	0.8430
Pinellas	1.3478	0.3892	1.0102	1.0725
Polk	0.4876	0.0922	0.3275	0.3681
Putnam	0.3947	0.0668	0.2529	0.2916
St. Johns	0.7291	0.1991	0.5397	0.5860
St. Lucie	1.7813	0.4612	1.2200	1.3839
Santa Rosa	1.5341	0.5346	1.1149	1.2594
Sarasota	1.8053	0.5780	1.3960	1.4610
Seminole	0.3773	0.0733	0.2505	0.2850
Sumter	0.5600	0.1094	0.3738	0.4280
Suwannee	0.2846	0.0530	0.1771	0.2147
Taylor	0.3425	0.0811	0.2576	0.2655
Union	0.3257	0.0690	0.2054	0.2518
Volusia	1.0622	0.2978	0.7642	0.8512
Wakulla	0.7189	0.2124	0.4615	0.5720
Walton	1.7154	0.6741	1.3745	1.4866
Washington	0.6146	0.1599	0.4244	0.5036
Statewide	**1.7868**	**0.5370**	**1.3532**	**1.4367**

Distribution of Loss Costs by County and Coverage
Storm Surge
(per 1,000 of exposure)

County	Structure	Contents	Time Element	Total Loss Costs
Bay	0.3334	0.3185	0.1165	0.3017
Brevard	0.0291	0.0288	0.0086	0.0260
Broward	0.0686	0.0685	0.0171	0.0613
Charlotte	2.3780	2.1575	0.7693	2.0845
Citrus	0.5688	0.4759	0.2045	0.4946
Collier	2.8705	2.7466	1.0120	2.5830
De Soto	0.0157	0.0158	0.0069	0.0146
Dixie	0.0643	0.0531	0.0200	0.0549
Duval	0.0026	0.0028	0.0012	0.0024
Escambia	0.0134	0.0133	0.0043	0.0121
Flagler	0.0121	0.0089	0.0032	0.0100
Franklin	1.8612	1.8366	0.6587	1.7134
Gulf	3.9397	3.4110	1.1398	3.4514
Hernando	0.0438	0.0458	0.0169	0.0404
Hillsborough	0.0684	0.0652	0.0249	0.0614
Indian River	0.0682	0.0632	0.0154	0.0594
Jefferson	0.0226	0.0401	0.0106	0.0250
Lee	1.8124	1.5724	0.5545	1.5745
Levy	0.2449	0.1557	0.0616	0.1993
Liberty	0.0001	0.0001	0.0000	0.0001
Manatee	0.1552	0.1260	0.0571	0.1338
Martin	0.0441	0.0266	0.0070	0.0342
Miami-Dade	0.1492	0.1346	0.0401	0.1305
Monroe	0.9572	1.1409	0.3485	0.9132
Nassau	0.0117	0.0142	0.0046	0.0112
Okaloosa	0.1370	0.1247	0.0478	0.1219
Palm Beach	0.0551	0.0519	0.0171	0.0491
Pasco	0.2220	0.2106	0.0862	0.1999
Pinellas	0.1937	0.1479	0.0657	0.1651
St. Johns	0.0452	0.0358	0.0139	0.0388
St. Lucie	0.0119	0.0102	0.0028	0.0102
Santa Rosa	0.1616	0.1570	0.0553	0.1460
Sarasota	0.5173	0.4563	0.1710	0.4521
Taylor	0.0976	0.0827	0.0354	0.0852
Volusia	0.0355	0.0309	0.0133	0.0313
Wakulla	0.3115	0.3113	0.1087	0.2844
Walton	0.3024	0.3097	0.1246	0.2817
Statewide	**0.2759**	**0.2412**	**0.0888**	**0.2414**

Distribution of Loss Costs by County and Coverage
Tropical Cyclone and Storm Surge combined
(per 1,000 of Expoure)

County	Structure	Contents	Time Element	Total Loss Costs
Alachua	0.3284	0.0751	0.2440	0.2619
Baker	0.4901	0.1045	0.3352	0.3880
Bay	1.5801	0.6727	1.0230	1.3139
Bradford	0.5160	0.1022	0.3453	0.4016
Brevard	1.1914	0.3280	0.8054	0.9316
Broward	3.1343	0.9887	2.4082	2.5199
Calhoun	0.6556	0.1591	0.3971	0.5060
Charlotte	4.4562	2.8317	2.2709	3.7526
Citrus	1.3788	0.6978	0.8068	1.1378
Clay	0.2583	0.0503	0.1668	0.1963
Collier	5.8646	3.8554	3.3355	5.0709
Columbia	0.3035	0.0605	0.1976	0.2327
De Soto	0.8611	0.1841	0.5338	0.6322
Dixie	0.6081	0.1606	0.3769	0.4639
Duval	0.2320	0.0499	0.1629	0.1780
Escambia	1.0118	0.2869	0.6865	0.8034
Flagler	0.9982	0.2964	0.6828	0.7845
Franklin	3.7064	2.5165	2.0642	3.2692
Gadsden	0.3875	0.0924	0.2613	0.3039
Gilchrist	0.3397	0.0637	0.2239	0.2615
Glades	1.5376	0.3029	1.0273	1.1697
Gulf	6.4536	4.4006	3.0265	5.5719
Hamilton	0.2350	0.0434	0.1609	0.1799
Hardee	0.6673	0.1228	0.4151	0.5070
Hendry	1.1941	0.2685	0.7404	0.8711
Hernando	0.7335	0.2055	0.4959	0.5775
Highlands	0.7305	0.1512	0.4665	0.5566
Hillsborough	0.6256	0.1875	0.4060	0.4895
Holmes	0.5978	0.1330	0.4119	0.4836
Indian River	2.3679	0.7265	1.6530	1.8792
Jackson	0.4214	0.0880	0.2690	0.3305
Jefferson	0.3097	0.1087	0.1930	0.2515
Lafayette	0.3431	0.0648	0.1945	0.2526
Lake	0.3855	0.0735	0.2418	0.2913
Lee	3.3123	1.9886	1.6200	2.7647
Leon	0.2297	0.0548	0.1577	0.1821
Levy	0.9030	0.3026	0.4952	0.7112
Liberty	0.5457	0.1130	0.3446	0.4235
Madison	0.2166	0.0424	0.1438	0.1672
Manatee	1.7104	0.6119	1.2878	1.3854
Marion	0.4314	0.0878	0.2902	0.3254
Martin	2.4414	0.6982	1.7334	1.9117
Miami-Dade	3.7003	1.2146	2.7237	2.9848
Monroe	7.7378	4.3415	6.3882	6.9054
Nassau	0.4069	0.1273	0.2914	0.3317
Okaloosa	1.7626	0.6894	1.2664	1.4640
Okeechobee	1.2643	0.2585	0.7930	0.9602
Orange	0.4237	0.0824	0.2840	0.3302
Osceola	0.4497	0.0911	0.3202	0.3667
Palm Beach	3.3771	1.0743	2.5830	2.7229
Pasco	1.2748	0.5144	0.8697	1.0429
Pinellas	1.5415	0.5371	1.0759	1.2377
Polk	0.4876	0.0922	0.3275	0.3681
Putnam	0.3947	0.0668	0.2529	0.2916
St. Johns	0.7743	0.2350	0.5536	0.6248
St. Lucie	1.7933	0.4714	1.2228	1.3941
Santa Rosa	1.6957	0.6916	1.1703	1.4054
Sarasota	2.3227	1.0344	1.5670	1.9130
Seminole	0.3773	0.0733	0.2505	0.2850
Sumter	0.5600	0.1094	0.3738	0.4280
Suwannee	0.2846	0.0530	0.1771	0.2147
Taylor	0.4402	0.1638	0.2930	0.3508
Union	0.3257	0.0690	0.2054	0.2518
Volusia	1.0977	0.3287	0.7776	0.8825
Wakulla	1.0304	0.5237	0.5701	0.8563
Walton	2.0178	0.9838	1.4991	1.7682
Washington	0.6146	0.1599	0.4244	0.5036
Statewide	**2.0008**	**0.7262**	**1.4228**	**1.6248**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	72,726,730	16.7%
Light Metal	36,127,105	8.3%
Other Concrete	12,656,626	2.9%
Reinforced Concrete	30,937,756	7.1%
Reinforced Masonry	34,287,490	7.9%
Steel Moment Resistant Frame - Distributed	65,404,598	15.1%
Steel Moment Resistant Frame - Perimeter	76,683,465	17.7%
Unreinforced Masonry	82,557,622	19.0%
Wood Frame	22,938,433	5.3%
County Total	**434,319,826**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	7,168,641	1.7%
Air	6,186,303	1.4%
Construction	114,005	0.0%
Electrical	1,534,506	0.4%
Entertainment & Recreation	11,025,237	2.5%
General Commercial	44,536,299	10.3%
Government Services	43,508,097	10.0%
Health Care Services	26,189,835	6.0%
Heavy Fabrication & Assembly	7,651,261	1.8%
High Technology	1,828,759	0.4%
Highway	14,023,449	3.2%
Industrial Processing Facility	6,335,381	1.5%
Light Fabrication & Assembly	9,778,363	2.3%
Mining	381,382	0.1%
Parking	10,714,623	2.5%
Personal and Business Services	61,887,049	14.2%
Petroleum	193,858	0.0%
Retail Trade	96,475,976	22.2%
Sea & Inland Waterways	3,053,745	0.7%
Telephone and Telegraph	158,604	0.0%
Temporary Lodging	46,809,706	10.8%
University & College	33,269,068	7.7%
Wholesale Trade	1,495,677	0.3%
County Total	**434,319,826**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	44,213,122	16.1%
Light Metal	23,088,837	8.4%
Other Concrete	10,664,587	3.9%
Reinforced Concrete	17,333,549	6.3%
Reinforced Masonry	20,159,605	7.3%
Steel Moment Resistant Frame - Distributed	35,326,266	12.9%
Steel Moment Resistant Frame - Perimeter	51,328,378	18.7%
Unreinforced Masonry	57,347,153	20.9%
Wood Frame	15,132,317	5.5%
County Total	**274,593,814**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	7,856,430	2.9%
Air	4,217,728	1.5%
Construction	78,029	0.0%
Electrical	1,226,224	0.4%
Entertainment & Recreation	8,240,494	3.0%
General Commercial	26,789,155	9.8%
Government Services	21,440,947	7.8%
Health Care Services	13,004,420	4.7%
Heavy Fabrication & Assembly	8,519,180	3.1%
High Technology	2,056,046	0.7%
Highway	9,932,609	3.6%
Industrial Processing Facility	5,563,402	2.0%
Light Fabrication & Assembly	7,998,993	2.9%
Mining	153,109	0.1%
Parking	7,863,220	2.9%
Personal and Business Services	36,458,945	13.3%
Petroleum	362,320	0.1%
Retail Trade	65,388,904	23.8%
Sea & Inland Waterways	3,839,353	1.4%
Telephone and Telegraph	212,855	0.1%
Temporary Lodging	26,634,051	9.7%
University & College	15,451,128	5.6%
Wholesale Trade	1,306,271	0.5%
County Total	**274,593,814**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	27,652,041	13.2%
Light Metal	26,084,195	12.5%
Other Concrete	6,783,522	3.2%
Reinforced Concrete	10,829,606	5.2%
Reinforced Masonry	13,796,214	6.6%
Steel Moment Resistant Frame - Distributed	26,741,764	12.8%
Steel Moment Resistant Frame - Perimeter	33,822,943	16.2%
Unreinforced Masonry	50,860,269	24.3%
Wood Frame	12,313,634	5.9%
County Total	**208,884,188**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	10,402,775	5.0%
Air	897,933	0.4%
Construction	70,443	0.0%
Electrical	1,622,208	0.8%
Entertainment & Recreation	8,424,328	4.0%
General Commercial	21,753,941	10.4%
Government Services	17,375,582	8.3%
Health Care Services	8,857,152	4.2%
Heavy Fabrication & Assembly	3,811,026	1.8%
High Technology	2,239,146	1.1%
Highway	9,355,245	4.5%
Industrial Processing Facility	3,589,697	1.7%
Light Fabrication & Assembly	4,836,243	2.3%
Mining	124,451	0.1%
Parking	3,889,048	1.9%
Personal and Business Services	26,980,036	12.9%
Petroleum	339,780	0.2%
Retail Trade	56,542,302	27.1%
Sea & Inland Waterways	1,651,801	0.8%
Telephone and Telegraph	27,783	0.0%
Temporary Lodging	12,821,377	6.1%
University & College	12,070,331	5.8%
Wholesale Trade	1,201,560	0.6%
County Total	**208,884,188**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	3,699,600	11.9%
Light Metal	5,517,716	17.8%
Other Concrete	765,528	2.5%
Reinforced Concrete	1,754,290	5.6%
Reinforced Masonry	1,946,438	6.3%
Steel Moment Resistant Frame - Distributed	2,967,431	9.5%
Steel Moment Resistant Frame - Perimeter	5,010,152	16.1%
Unreinforced Masonry	7,279,626	23.4%
Wood Frame	2,134,065	6.9%
County Total	**31,074,848**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	1,368,197	4.4%
Air	470,905	1.5%
Construction	883	0.0%
Electrical	156,981	0.5%
Entertainment & Recreation	1,173,429	3.8%
General Commercial	2,166,117	7.0%
Government Services	2,827,371	9.1%
Health Care Services	941,443	3.0%
Heavy Fabrication & Assembly	600,315	1.9%
High Technology	150,710	0.5%
Highway	1,990,159	6.4%
Industrial Processing Facility	318,249	1.0%
Light Fabrication & Assembly	622,477	2.0%
Mining	7,527	0.0%
Parking	812,484	2.6%
Personal and Business Services	3,363,216	10.8%
Petroleum	13,249	0.0%
Retail Trade	5,877,998	18.9%
Sea & Inland Waterways	116,258	0.4%
Telephone and Telegraph	3,871	0.0%
Temporary Lodging	6,213,508	20.0%
University & College	1,816,843	5.8%
Wholesale Trade	62,657	0.2%
County Total	**31,074,848**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	4,057,970	13.5%
Light Metal	4,221,813	14.0%
Other Concrete	922,695	3.1%
Reinforced Concrete	1,580,495	5.2%
Reinforced Masonry	1,937,576	6.4%
Steel Moment Resistant Frame - Distributed	3,760,067	12.5%
Steel Moment Resistant Frame - Perimeter	4,252,481	14.1%
Unreinforced Masonry	6,799,796	22.6%
Wood Frame	2,619,200	8.7%
County Total	**30,152,095**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	1,214,527	4.0%
Air	164,676	0.5%
Construction	39,921	0.1%
Electrical	197,684	0.7%
Entertainment & Recreation	868,755	2.9%
General Commercial	2,937,322	9.7%
Government Services	2,469,588	8.2%
Health Care Services	1,540,751	5.1%
Heavy Fabrication & Assembly	949,618	3.1%
High Technology	143,434	0.5%
Highway	1,606,952	5.3%
Industrial Processing Facility	566,722	1.9%
Light Fabrication & Assembly	592,551	2.0%
Mining	19,351	0.1%
Parking	738,401	2.4%
Personal and Business Services	4,649,255	15.4%
Petroleum	33,742	0.1%
Retail Trade	7,295,289	24.2%
Sea & Inland Waterways	280,621	0.9%
Telephone and Telegraph	1,640	0.0%
Temporary Lodging	1,452,833	4.8%
University & College	2,209,542	7.3%
Wholesale Trade	178,919	0.6%
County Total	**30,152,095**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	7,535,598	12.5%
Light Metal	6,476,549	10.7%
Other Concrete	1,773,236	2.9%
Reinforced Concrete	3,130,298	5.2%
Reinforced Masonry	3,838,676	6.3%
Steel Moment Resistant Frame - Distributed	6,610,100	10.9%
Steel Moment Resistant Frame - Perimeter	9,178,597	15.2%
Unreinforced Masonry	15,969,810	26.4%
Wood Frame	5,939,428	9.8%
County Total	**60,452,292**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	2,123,252	3.5%
Air	229,855	0.4%
Construction	21,413	0.0%
Electrical	377,533	0.6%
Entertainment & Recreation	2,109,353	3.5%
General Commercial	5,878,802	9.7%
Government Services	6,987,077	11.6%
Health Care Services	3,937,512	6.5%
Heavy Fabrication & Assembly	1,677,738	2.8%
High Technology	1,015,525	1.7%
Highway	2,197,517	3.6%
Industrial Processing Facility	802,385	1.3%
Light Fabrication & Assembly	1,033,065	1.7%
Mining	2,419	0.0%
Parking	1,332,398	2.2%
Personal and Business Services	7,172,776	11.9%
Petroleum	18,181	0.0%
Retail Trade	14,367,070	23.8%
Sea & Inland Waterways	571,131	0.9%
Telephone and Telegraph	41,886	0.1%
Temporary Lodging	4,414,527	7.3%
University & College	3,991,468	6.6%
Wholesale Trade	149,411	0.2%
County Total	**60,452,292**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	1,179,082	13.0%
Light Metal	1,509,603	16.7%
Other Concrete	226,221	2.5%
Reinforced Concrete	363,382	4.0%
Reinforced Masonry	577,528	6.4%
Steel Moment Resistant Frame - Distributed	923,592	10.2%
Steel Moment Resistant Frame - Perimeter	1,053,874	11.7%
Unreinforced Masonry	1,999,374	22.1%
Wood Frame	1,211,693	13.4%
County Total	**9,044,350**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	337,740	3.7%
Air	29,091	0.3%
Construction	8,591	0.1%
Electrical	22,638	0.3%
Entertainment & Recreation	254,874	2.8%
General Commercial	834,244	9.2%
Government Services	1,067,053	11.8%
Health Care Services	390,076	4.3%
Heavy Fabrication & Assembly	593,959	6.6%
High Technology	34,081	0.4%
Highway	610,227	6.7%
Industrial Processing Facility	184,310	2.0%
Light Fabrication & Assembly	146,064	1.6%
Mining	2,089	0.0%
Parking	232,905	2.6%
Personal and Business Services	1,088,365	12.0%
Petroleum	8,633	0.1%
Retail Trade	2,249,686	24.9%
Sea & Inland Waterways	58,788	0.6%
Telephone and Telegraph	223	0.0%
Temporary Lodging	323,915	3.6%
University & College	531,639	5.9%
Wholesale Trade	35,157	0.4%
County Total	**9,044,350**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	1,949,341	11.0%
Light Metal	2,510,340	14.2%
Other Concrete	284,362	1.6%
Reinforced Concrete	708,675	4.0%
Reinforced Masonry	1,235,603	7.0%
Steel Moment Resistant Frame - Distributed	1,544,784	8.7%
Steel Moment Resistant Frame - Perimeter	1,701,750	9.6%
Unreinforced Masonry	4,732,334	26.7%
Wood Frame	3,072,675	17.3%
County Total	**17,739,862**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	791,554	4.5%
Air	130,844	0.7%
Construction	3,694	0.0%
Electrical	178,382	1.0%
Entertainment & Recreation	715,592	4.0%
General Commercial	1,508,810	8.5%
Government Services	1,796,264	10.1%
Health Care Services	932,403	5.3%
Heavy Fabrication & Assembly	587,802	3.3%
High Technology	34,592	0.2%
Highway	872,833	4.9%
Industrial Processing Facility	653,949	3.7%
Light Fabrication & Assembly	330,500	1.9%
Mining	4,951	0.0%
Parking	462,001	2.6%
Personal and Business Services	1,972,863	11.1%
Petroleum	15,343	0.1%
Retail Trade	4,763,563	26.9%
Sea & Inland Waterways	173,422	1.0%
Telephone and Telegraph	2,721	0.0%
Temporary Lodging	648,471	3.7%
University & College	1,101,874	6.2%
Wholesale Trade	57,434	0.3%
County Total	**17,739,862**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	4,624,455	13.1%
Light Metal	5,182,634	14.7%
Other Concrete	936,077	2.6%
Reinforced Concrete	1,440,696	4.1%
Reinforced Masonry	2,509,320	7.1%
Steel	8,809	0.0%
Steel Moment Resistant Frame - Distributed	3,874,259	11.0%
Steel Moment Resistant Frame - Perimeter	4,126,307	11.7%
Unreinforced Masonry	9,257,068	26.2%
Wood Frame	3,371,999	9.5%
County Total	**35,331,625**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	2,140,529	6.1%
Air	360,344	1.0%
Construction	26,578	0.1%
Electrical	237,469	0.7%
Entertainment & Recreation	1,794,308	5.1%
General Commercial	2,743,068	7.8%
Government Services	2,696,516	7.6%
Health Care Services	2,076,163	5.9%
Heavy Fabrication & Assembly	529,969	1.5%
High Technology	114,025	0.3%
Highway	1,116,455	3.2%
Industrial Processing Facility	326,205	0.9%
Light Fabrication & Assembly	556,962	1.6%
Mining	25,497	0.1%
Parking	689,745	2.0%
Personal and Business Services	2,967,034	8.4%
Petroleum	9,001	0.0%
Retail Trade	10,685,803	30.2%
Sea & Inland Waterways	566,747	1.6%
Telephone and Telegraph	1,003	0.0%
Temporary Lodging	3,825,716	10.8%
University & College	1,615,233	4.6%
Wholesale Trade	227,257	0.6%
County Total	**35,331,625**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	4,229,153	9.1%
Light Metal	8,415,228	18.1%
Other Concrete	1,121,651	2.4%
Reinforced Concrete	2,731,908	5.9%
Reinforced Masonry	2,722,109	5.9%
Steel Moment Resistant Frame - Distributed	4,279,287	9.2%
Steel Moment Resistant Frame - Perimeter	4,953,351	10.7%
Unreinforced Masonry	12,145,094	26.2%
Wood Frame	5,794,021	12.5%
County Total	**46,391,802**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	2,726,278	5.9%
Air	292,457	0.6%
Construction	771	0.0%
Electrical	238,181	0.5%
Entertainment & Recreation	3,082,970	6.6%
General Commercial	4,816,211	10.4%
Government Services	2,883,378	6.2%
Health Care Services	2,139,752	4.6%
Heavy Fabrication & Assembly	625,811	1.3%
High Technology	159,932	0.3%
Highway	2,132,531	4.6%
Industrial Processing Facility	288,752	0.6%
Light Fabrication & Assembly	696,018	1.5%
Mining	23,449	0.1%
Parking	728,128	1.6%
Personal and Business Services	4,568,744	9.8%
Retail Trade	12,961,197	27.9%
Sea & Inland Waterways	1,237,896	2.7%
Telephone and Telegraph	14,322	0.0%
Temporary Lodging	4,862,907	10.5%
University & College	1,727,869	3.7%
Wholesale Trade	184,248	0.4%
County Total	**46,391,802**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	2,140,736	10.8%
Light Metal	3,925,348	19.8%
Other Concrete	392,978	2.0%
Reinforced Concrete	550,371	2.8%
Reinforced Masonry	1,415,671	7.1%
Steel Moment Resistant Frame - Distributed	1,689,498	8.5%
Steel Moment Resistant Frame - Perimeter	1,835,282	9.2%
Unreinforced Masonry	5,572,826	28.1%
Wood Frame	2,325,676	11.7%
County Total	**19,848,385**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	672,209	3.4%
Air	42,758	0.2%
Construction	1,255	0.0%
Electrical	107,690	0.5%
Entertainment & Recreation	738,198	3.7%
General Commercial	1,329,100	6.7%
Government Services	1,749,428	8.8%
Health Care Services	939,422	4.7%
Heavy Fabrication & Assembly	424,979	2.1%
High Technology	225,347	1.1%
Highway	1,449,408	7.3%
Industrial Processing Facility	322,017	1.6%
Light Fabrication & Assembly	417,609	2.1%
Mining	2,127	0.0%
Parking	502,480	2.5%
Personal and Business Services	1,858,605	9.4%
Petroleum	1,849	0.0%
Retail Trade	5,310,655	26.8%
Sea & Inland Waterways	82,232	0.4%
Telephone and Telegraph	1,457	0.0%
Temporary Lodging	2,563,204	12.9%
University & College	1,045,691	5.3%
Wholesale Trade	60,665	0.3%
County Total	**19,848,385**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	2,872,098	12.2%
Light Metal	3,787,097	16.0%
Other Concrete	756,005	3.2%
Reinforced Concrete	787,345	3.3%
Reinforced Masonry	1,653,214	7.0%
Steel Moment Resistant Frame - Distributed	2,220,384	9.4%
Steel Moment Resistant Frame - Perimeter	3,066,457	13.0%
Unreinforced Masonry	6,194,501	26.2%
Wood Frame	2,280,195	9.7%
County Total	**23,617,295**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	1,206,980	5.1%
Air	85,381	0.4%
Construction	4,723	0.0%
Electrical	122,887	0.5%
Entertainment & Recreation	771,487	3.3%
General Commercial	1,834,820	7.8%
Government Services	1,837,962	7.8%
Health Care Services	1,231,346	5.2%
Heavy Fabrication & Assembly	554,256	2.3%
High Technology	545,176	2.3%
Highway	1,408,726	6.0%
Industrial Processing Facility	387,491	1.6%
Light Fabrication & Assembly	276,828	1.2%
Mining	1,020	0.0%
Parking	534,674	2.3%
Personal and Business Services	2,415,162	10.2%
Petroleum	10,093	0.0%
Retail Trade	7,008,711	29.7%
Sea & Inland Waterways	251,556	1.1%
Telephone and Telegraph	1,334	0.0%
Temporary Lodging	1,551,371	6.6%
University & College	1,484,155	6.3%
Wholesale Trade	91,158	0.4%
County Total	**23,617,295**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	4,397,175	13.2%
Light Metal	4,579,470	13.7%
Other Concrete	934,523	2.8%
Reinforced Concrete	1,479,547	4.4%
Reinforced Masonry	2,603,460	7.8%
Steel Moment Resistant Frame - Distributed	3,286,225	9.8%
Steel Moment Resistant Frame - Perimeter	4,442,252	13.3%
Unreinforced Masonry	8,507,231	25.5%
Wood Frame	3,185,615	9.5%
County Total	**33,415,497**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	1,576,596	4.7%
Air	87,843	0.3%
Construction	5,350	0.0%
Electrical	224,798	0.7%
Entertainment & Recreation	1,149,035	3.4%
General Commercial	3,338,132	10.0%
Government Services	2,484,938	7.4%
Health Care Services	2,294,870	6.9%
Heavy Fabrication & Assembly	737,760	2.2%
High Technology	78,241	0.2%
Highway	1,317,005	3.9%
Industrial Processing Facility	859,778	2.6%
Light Fabrication & Assembly	635,211	1.9%
Mining	16,356	0.0%
Parking	676,018	2.0%
Personal and Business Services	3,899,183	11.7%
Petroleum	63,540	0.2%
Retail Trade	10,312,650	30.9%
Sea & Inland Waterways	150,343	0.4%
Telephone and Telegraph	502	0.0%
Temporary Lodging	2,093,831	6.3%
University & College	1,264,735	3.8%
Wholesale Trade	148,781	0.4%
County Total	**33,415,497**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	320,697	8.9%
Light Metal	504,720	13.9%
Other Concrete	85,801	2.4%
Reinforced Concrete	134,936	3.7%
Reinforced Masonry	212,159	5.9%
Steel Moment Resistant Frame - Distributed	510,538	14.1%
Steel Moment Resistant Frame - Perimeter	400,043	11.1%
Unreinforced Masonry	983,976	27.2%
Wood Frame	467,219	12.9%
County Total	**3,620,090**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	154,865	4.3%
Air	29,615	0.8%
Construction	2,183	0.1%
Electrical	27,268	0.8%
Entertainment & Recreation	149,167	4.1%
General Commercial	300,699	8.3%
Government Services	439,016	12.1%
Health Care Services	183,677	5.1%
Heavy Fabrication & Assembly	50,059	1.4%
High Technology	19,259	0.5%
Highway	149,608	4.1%
Industrial Processing Facility	40,244	1.1%
Light Fabrication & Assembly	103,636	2.9%
Mining	492	0.0%
Parking	94,796	2.6%
Personal and Business Services	420,047	11.6%
Petroleum	414	0.0%
Retail Trade	938,870	25.9%
Sea & Inland Waterways	1,776	0.0%
Telephone and Telegraph	243	0.0%
Temporary Lodging	87,563	2.4%
University & College	419,389	11.6%
Wholesale Trade	7,203	0.2%
County Total	**3,620,090**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	741,782	11.7%
Light Metal	860,462	13.6%
Other Concrete	195,379	3.1%
Reinforced Concrete	270,365	4.3%
Reinforced Masonry	427,233	6.8%
Steel Moment Resistant Frame - Distributed	702,600	11.1%
Steel Moment Resistant Frame - Perimeter	856,248	13.5%
Unreinforced Masonry	1,557,511	24.6%
Wood Frame	712,182	11.3%
County Total	**6,323,761**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	375,464	5.9%
Air	52,080	0.8%
Construction	1,445	0.0%
Electrical	45,275	0.7%
Entertainment & Recreation	235,025	3.7%
General Commercial	704,175	11.1%
Government Services	590,989	9.3%
Health Care Services	249,985	4.0%
Heavy Fabrication & Assembly	136,653	2.2%
High Technology	56,185	0.9%
Highway	205,575	3.3%
Industrial Processing Facility	94,718	1.5%
Light Fabrication & Assembly	160,830	2.5%
Mining	2,005	0.0%
Parking	144,333	2.3%
Personal and Business Services	680,409	10.8%
Petroleum	2,386	0.0%
Retail Trade	1,916,200	30.3%
Sea & Inland Waterways	5,148	0.1%
Telephone and Telegraph	4,401	0.1%
Temporary Lodging	255,772	4.0%
University & College	394,548	6.2%
Wholesale Trade	10,159	0.2%
County Total	**6,323,761**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	3,309,111	18.1%
Light Metal	583,357	3.2%
Other Concrete	510,867	2.8%
Reinforced Concrete	900,275	4.9%
Reinforced Masonry	2,407,894	13.2%
Steel Moment Resistant Frame - Distributed	3,162,564	17.3%
Steel Moment Resistant Frame - Perimeter	4,254,184	23.3%
Unreinforced Masonry	2,424,167	13.3%
Wood Frame	696,729	3.8%
County Total	**18,249,146**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	237,390	1.3%
Air	207,721	1.1%
Construction	1,300	0.0%
Electrical	52,219	0.3%
Entertainment & Recreation	506,191	2.8%
General Commercial	2,605,015	14.3%
Government Services	1,407,388	7.7%
Health Care Services	943,544	5.2%
Heavy Fabrication & Assembly	288,074	1.6%
High Technology	96,592	0.5%
Highway	340,757	1.9%
Industrial Processing Facility	229,002	1.3%
Light Fabrication & Assembly	280,157	1.5%
Mining	20,017	0.1%
Parking	580,892	3.2%
Personal and Business Services	3,192,790	17.5%
Petroleum	42,902	0.2%
Retail Trade	3,352,052	18.4%
Sea & Inland Waterways	338,480	1.9%
Telephone and Telegraph	4,592	0.0%
Temporary Lodging	2,657,941	14.6%
University & College	851,129	4.7%
Wholesale Trade	12,998	0.1%
County Total	**18,249,146**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	1,088,399	17.7%
Light Metal	136,375	2.2%
Other Concrete	185,477	3.0%
Reinforced Concrete	397,096	6.5%
Reinforced Masonry	600,655	9.8%
Steel Moment Resistant Frame - Distributed	927,680	15.1%
Steel Moment Resistant Frame - Perimeter	1,628,581	26.5%
Unreinforced Masonry	932,654	15.2%
Wood Frame	245,935	4.0%
County Total	**6,142,852**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	108,920	1.8%
Air	21,614	0.4%
Construction	4,623	0.1%
Electrical	8,369	0.1%
Entertainment & Recreation	138,780	2.3%
General Commercial	709,579	11.6%
Government Services	390,926	6.4%
Health Care Services	279,262	4.5%
Heavy Fabrication & Assembly	119,811	2.0%
High Technology	42,988	0.7%
Highway	161,446	2.6%
Industrial Processing Facility	77,025	1.3%
Light Fabrication & Assembly	101,911	1.7%
Mining	1,067	0.0%
Parking	121,652	2.0%
Personal and Business Services	1,004,782	16.4%
Petroleum	1,255	0.0%
Retail Trade	1,353,449	22.0%
Sea & Inland Waterways	341,844	5.6%
Telephone and Telegraph	3,346	0.1%
Temporary Lodging	903,611	14.7%
University & College	220,700	3.6%
Wholesale Trade	25,891	0.4%
County Total	**6,142,852**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	446,439	12.9%
Light Metal	102,631	3.0%
Other Concrete	201,962	5.8%
Reinforced Concrete	124,102	3.6%
Reinforced Masonry	283,347	8.2%
Steel Moment Resistant Frame - Distributed	757,607	21.9%
Steel Moment Resistant Frame - Perimeter	669,321	19.3%
Unreinforced Masonry	736,244	21.3%
Wood Frame	142,975	4.1%
County Total	**3,464,629**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	75,857	2.2%
Air	1,608	0.0%
Construction	0	0.0%
Electrical	3,829	0.1%
Entertainment & Recreation	65,990	1.9%
General Commercial	438,122	12.6%
Government Services	192,984	5.6%
Health Care Services	163,599	4.7%
Heavy Fabrication & Assembly	17,469	0.5%
High Technology	7,875	0.2%
Highway	132,894	3.8%
Industrial Processing Facility	158,012	4.6%
Light Fabrication & Assembly	24,955	0.7%
Mining	8	0.0%
Parking	11,540	0.3%
Personal and Business Services	515,703	14.9%
Retail Trade	1,071,134	30.9%
Sea & Inland Waterways	82,110	2.4%
Telephone and Telegraph	100	0.0%
Temporary Lodging	376,993	10.9%
University & College	115,710	3.3%
Wholesale Trade	8,137	0.2%
County Total	**3,464,629**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	636,037	17.2%
Light Metal	224,220	6.1%
Other Concrete	79,348	2.1%
Reinforced Concrete	245,784	6.6%
Reinforced Masonry	336,023	9.1%
Steel Moment Resistant Frame - Distributed	621,920	16.8%
Steel Moment Resistant Frame - Perimeter	633,273	17.1%
Unreinforced Masonry	792,041	21.4%
Wood Frame	130,228	3.5%
County Total	**3,698,876**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	60,262	1.6%
Air	2,055	0.1%
Construction	5,627	0.2%
Electrical	43,510	1.2%
Entertainment & Recreation	67,637	1.8%
General Commercial	367,170	9.9%
Government Services	184,704	5.0%
Health Care Services	335,685	9.1%
Heavy Fabrication & Assembly	339,834	9.2%
High Technology	8,272	0.2%
Highway	93,846	2.5%
Industrial Processing Facility	106,209	2.9%
Light Fabrication & Assembly	42,732	1.2%
Mining	18,083	0.5%
Parking	74,317	2.0%
Personal and Business Services	792,336	21.4%
Petroleum	23,930	0.6%
Retail Trade	504,218	13.6%
Sea & Inland Waterways	115,517	3.1%
Temporary Lodging	198,074	5.4%
University & College	163,545	4.4%
Wholesale Trade	151,311	4.1%
County Total	**3,698,876**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	1,436,646	16.5%
Light Metal	411,532	4.7%
Other Concrete	248,270	2.9%
Reinforced Concrete	373,651	4.3%
Reinforced Masonry	937,224	10.8%
Steel Moment Resistant Frame - Distributed	1,395,049	16.1%
Steel Moment Resistant Frame - Perimeter	1,632,159	18.8%
Unreinforced Masonry	1,651,863	19.0%
Wood Frame	600,940	6.9%
County Total	**8,687,334**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	177,441	2.0%
Air	3,245	0.0%
Construction	276	0.0%
Electrical	1,586	0.0%
Entertainment & Recreation	450,684	5.2%
General Commercial	1,224,443	14.1%
Government Services	506,986	5.8%
Health Care Services	403,939	4.6%
Heavy Fabrication & Assembly	128,274	1.5%
High Technology	42,439	0.5%
Highway	132,102	1.5%
Industrial Processing Facility	81,029	0.9%
Light Fabrication & Assembly	63,640	0.7%
Mining	2,327	0.0%
Parking	98,026	1.1%
Personal and Business Services	982,469	11.3%
Petroleum	1,705	0.0%
Retail Trade	2,232,955	25.7%
Sea & Inland Waterways	322,913	3.7%
Temporary Lodging	1,511,660	17.4%
University & College	290,003	3.3%
Wholesale Trade	29,194	0.3%
County Total	**8,687,334**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	9,957	9.8%
Light Metal	44,033	43.4%
Other Concrete	1,165	1.1%
Reinforced Concrete	1,695	1.7%
Reinforced Masonry	6,763	6.7%
Steel Moment Resistant Frame - Distributed	6,468	6.4%
Steel Moment Resistant Frame - Perimeter	9,206	9.1%
Unreinforced Masonry	11,879	11.7%
Wood Frame	10,373	10.2%
County Total	**101,540**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	999	1.0%
Air	0	0.0%
Construction	568	0.6%
Electrical	48	0.0%
Entertainment & Recreation	2,002	2.0%
General Commercial	4,606	4.5%
Government Services	6,552	6.5%
Health Care Services	1,553	1.5%
Heavy Fabrication & Assembly	44,985	44.3%
High Technology	365	0.4%
Highway	1,548	1.5%
Industrial Processing Facility	1,063	1.0%
Light Fabrication & Assembly	450	0.4%
Parking	3,151	3.1%
Personal and Business Services	5,331	5.3%
Petroleum	7	0.0%
Retail Trade	15,402	15.2%
Sea & Inland Waterways	2,328	2.3%
Telephone and Telegraph	7	0.0%
Temporary Lodging	7,297	7.2%
University & College	3,168	3.1%
Wholesale Trade	111	0.1%
County Total	**101,540**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	22,942	9.7%
Light Metal	4,074	1.7%
Other Concrete	6,712	2.8%
Reinforced Concrete	46,797	19.7%
Reinforced Masonry	3,358	1.4%
Steel Moment Resistant Frame - Distributed	55,235	23.2%
Steel Moment Resistant Frame - Perimeter	19,230	8.1%
Unreinforced Masonry	49,942	21.0%
Wood Frame	29,382	12.4%
County Total	**237,672**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	3,430	1.4%
Electrical	57	0.0%
Entertainment & Recreation	18,046	7.6%
General Commercial	24,306	10.2%
Government Services	10,082	4.2%
Health Care Services	869	0.4%
Heavy Fabrication & Assembly	26	0.0%
Highway	329	0.1%
Industrial Processing Facility	19	0.0%
Light Fabrication & Assembly	937	0.4%
Parking	801	0.3%
Personal and Business Services	43,866	18.5%
Retail Trade	79,980	33.7%
Sea & Inland Waterways	33,394	14.1%
Temporary Lodging	16,872	7.1%
University & College	4,658	2.0%
County Total	**237,672**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	7,360,984	17.2%
Light Metal	1,878,233	4.4%
Other Concrete	1,377,475	3.2%
Reinforced Concrete	1,372,824	3.2%
Reinforced Masonry	5,148,176	12.1%
Steel	3,825	0.0%
Steel Moment Resistant Frame - Distributed	6,715,345	15.7%
Steel Moment Resistant Frame - Perimeter	6,620,033	15.5%
Unreinforced Masonry	9,009,344	21.1%
Wood Frame	3,208,718	7.5%
County Total	**42,694,955**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	1,786,233	4.2%
Air	6,333	0.0%
Construction	106,606	0.2%
Electrical	305,867	0.7%
Entertainment & Recreation	1,761,173	4.1%
General Commercial	4,781,980	11.2%
Government Services	2,700,891	6.3%
Health Care Services	4,177,919	9.8%
Heavy Fabrication & Assembly	434,769	1.0%
High Technology	103,431	0.2%
Highway	604,203	1.4%
Industrial Processing Facility	316,966	0.7%
Light Fabrication & Assembly	711,948	1.7%
Mining	29,690	0.1%
Parking	748,183	1.8%
Personal and Business Services	4,146,520	9.7%
Petroleum	1,881	0.0%
Retail Trade	11,556,679	27.1%
Sea & Inland Waterways	1,231,953	2.9%
Telephone and Telegraph	146	0.0%
Temporary Lodging	5,418,548	12.7%
University & College	1,626,807	3.8%
Wholesale Trade	136,230	0.3%
County Total	**42,694,955**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	5,957,806	13.4%
Light Metal	2,921,244	6.6%
Other Concrete	1,482,547	3.3%
Reinforced Concrete	1,915,509	4.3%
Reinforced Masonry	5,006,636	11.3%
Steel Moment Resistant Frame - Distributed	6,337,253	14.2%
Steel Moment Resistant Frame - Perimeter	6,675,792	15.0%
Unreinforced Masonry	9,847,771	22.1%
Wood Frame	4,333,001	9.7%
County Total	**44,477,560**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	1,805,739	4.1%
Air	163,354	0.4%
Construction	1,941	0.0%
Electrical	255,709	0.6%
Entertainment & Recreation	2,220,945	5.0%
General Commercial	5,252,290	11.8%
Government Services	2,213,014	5.0%
Health Care Services	2,209,968	5.0%
Heavy Fabrication & Assembly	550,895	1.2%
High Technology	262,799	0.6%
Highway	1,120,974	2.5%
Industrial Processing Facility	344,391	0.8%
Light Fabrication & Assembly	837,726	1.9%
Mining	33,357	0.1%
Parking	1,066,633	2.4%
Personal and Business Services	6,129,057	13.8%
Retail Trade	12,545,773	28.2%
Sea & Inland Waterways	1,457,735	3.3%
Telephone and Telegraph	7,666	0.0%
Temporary Lodging	4,104,096	9.2%
University & College	1,732,453	3.9%
Wholesale Trade	161,046	0.4%
County Total	**44,477,560**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	87,624	13.2%
Light Metal	32,454	4.9%
Other Concrete	18,663	2.8%
Reinforced Concrete	8,889	1.3%
Reinforced Masonry	98,018	14.8%
Steel Moment Resistant Frame - Distributed	95,129	14.3%
Steel Moment Resistant Frame - Perimeter	93,398	14.1%
Unreinforced Masonry	165,878	25.0%
Wood Frame	63,403	9.6%
County Total	**663,457**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	15,033	2.3%
Air	2,967	0.4%
Construction	49	0.0%
Electrical	1,896	0.3%
Entertainment & Recreation	24,338	3.7%
General Commercial	52,805	8.0%
Government Services	46,450	7.0%
Health Care Services	22,667	3.4%
Heavy Fabrication & Assembly	12,474	1.9%
High Technology	3,856	0.6%
Highway	10,471	1.6%
Industrial Processing Facility	7,013	1.1%
Light Fabrication & Assembly	12,890	1.9%
Mining	8	0.0%
Parking	19,558	2.9%
Personal and Business Services	98,485	14.8%
Retail Trade	194,439	29.3%
Sea & Inland Waterways	4,711	0.7%
Telephone and Telegraph	34	0.0%
Temporary Lodging	115,671	17.4%
University & College	15,178	2.3%
Wholesale Trade	2,464	0.4%
County Total	**663,457**	**100.0%**

Construction	AAL Ground Up - Structure	% of Total
Braced Steel Frame	97,187	16.4%
Light Metal	40,011	6.8%
Other Concrete	22,119	3.7%
Reinforced Concrete	24,825	4.2%
Reinforced Masonry	61,189	10.3%
Steel Moment Resistant Frame - Distributed	76,278	12.9%
Steel Moment Resistant Frame - Perimeter	110,322	18.6%
Unreinforced Masonry	122,503	20.7%
Wood Frame	37,730	6.4%
County Total	**592,163**	**100.0%**

Occupancy	AAL Ground Up - Structure	% of Total
Agriculture	27,448	4.6%
Air	1,801	0.3%
Electrical	424	0.1%
Entertainment & Recreation	36,077	6.1%
General Commercial	40,544	6.8%
Government Services	37,650	6.4%
Health Care Services	47,608	8.0%
Heavy Fabrication & Assembly	3,578	0.6%
High Technology	3,195	0.5%
Highway	8,615	1.5%
Industrial Processing Facility	11,579	2.0%
Light Fabrication & Assembly	7,403	1.3%
Parking	13,380	2.3%
Personal and Business Services	88,250	14.9%
Petroleum	66	0.0%
Retail Trade	163,756	27.7%
Sea & Inland Waterways	21,755	3.7%
Telephone and Telegraph	14	0.0%
Temporary Lodging	30,273	5.1%
University & College	46,002	7.8%
Wholesale Trade	2,747	0.5%
County Total	**592,163**	**100.0%**

ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001
00042	1	32139	1	32305	1	32449	1
00045	1	32140	1	32306	1	32455	1
00087	1	32145	1	32307	1	32460	1
32003	1	32148	1	32308	1	32462	1
32008	1	32159	1	32309	1	32464	1
32009	1	32162	1	32310	1	32567	1
32011	1	32177	1	32311	1	32601	1
32013	1	32179	1	32312	1	32603	1
32024	1	32180	1	32317	1	32605	1
32025	1	32181	1	32321	1	32606	1
32033	1	32187	1	32324	1	32607	1
32038	1	32189	1	32327	1	32608	1
32040	1	32190	1	32331	1	32609	1
32043	1	32195	1	32332	1	32611	1
32044	1	32202	1	32333	1	32615	1
32046	1	32204	1	32334	1	32617	1
32052	1	32205	1	32336	1	32618	1
32053	1	32206	1	32340	1	32619	1
32054	1	32207	1	32343	1	32621	1
32055	1	32208	1	32344	1	32622	1
32058	1	32209	1	32347	1	32626	1
32059	1	32210	1	32348	1	32628	1
32060	1	32211	1	32350	1	32631	1
32061	1	32212	1	32351	1	32640	1
32062	1	32214	1	32352	1	32641	1
32063	1	32215	1	32355	1	32643	1
32064	1	32216	1	32356	1	32653	1
32065	1	32217	1	32358	1	32656	1
32066	1	32218	1	32420	1	32666	1
32068	1	32219	1	32421	1	32667	1
32071	1	32220	1	32423	1	32668	1
32073	1	32221	1	32424	1	32669	1
32083	1	32222	1	32425	1	32680	1
32087	1	32223	1	32426	1	32686	1
32091	1	32226	1	32427	1	32693	1
32092	1	32234	1	32428	1	32694	1
32094	1	32244	1	32430	1	32696	1
32096	1	32246	1	32431	1	32701	1
32097	1	32254	1	32433	1	32702	1
32102	1	32256	1	32435	1	32703	1
32110	1	32257	1	32438	1	32707	1
32112	1	32258	1	32440	1	32708	1
32113	1	32259	1	32442	1	32709	1
32124	1	32277	1	32443	1	32712	1
32130	1	32301	1	32445	1	32713	1
32131	1	32303	1	32446	1	32714	1
32134	1	32304	1	32448	1	32720	1

ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001
32724	1	32826	1	33597	1	33849	1
32725	1	32827	1	33598	1	33850	1
32726	1	32828	1	33602	1	33852	1
32730	1	32829	1	33603	1	33853	1
32732	1	32830	1	33604	1	33857	1
32735	1	32831	1	33605	1	33859	1
32736	1	32832	1	33606	1	33860	1
32738	1	32833	1	33607	1	33865	1
32744	1	32835	1	33609	1	33868	1
32746	1	32836	1	33610	1	33870	1
32750	1	32837	1	33611	1	33872	1
32751	1	32839	1	33612	1	33873	1
32757	1	33440	1	33613	1	33875	1
32763	1	33471	1	33614	1	33876	1
32764	1	33510	1	33615	1	33880	1
32765	1	33511	1	33616	1	33881	1
32766	1	33513	1	33617	1	33884	1
32767	1	33514	1	33618	1	33890	1
32771	1	33523	1	33619	1	33896	1
32773	1	33525	1	33620	1	33897	1
32776	1	33527	1	33621	1	33898	1
32778	1	33534	1	33624	1	33920	1
32779	1	33538	1	33625	1	33935	1
32784	1	33540	1	33629	1	33936	1
32789	1	33541	1	33634	1	33960	1
32792	1	33542	1	33637	1	33972	1
32798	1	33543	1	33647	1	33982	1
32801	1	33544	1	33801	1	33983	1
32803	1	33547	1	33803	1	34142	1
32804	1	33548	1	33805	1	34251	1
32805	1	33549	1	33809	1	34266	1
32806	1	33556	1	33810	1	34269	1
32807	1	33558	1	33811	1	34420	1
32808	1	33559	1	33812	1	34428	1
32809	1	33563	1	33813	1	34429	1
32810	1	33565	1	33815	1	34431	1
32811	1	33566	1	33823	1	34432	1
32812	1	33567	1	33825	1	34433	1
32814	1	33569	1	33827	1	34434	1
32817	1	33570	1	33830	1	34436	1
32818	1	33572	1	33834	1	34442	1
32819	1	33573	1	33837	1	34446	1
32820	1	33576	1	33838	1	34448	1
32821	1	33584	1	33839	1	34449	1
32822	1	33585	1	33841	1	34450	1
32824	1	33592	1	33843	1	34452	1
32825	1	33594	1	33844	1	34453	1

ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001
34461	1	34753	1	32568	3	32563	4
34465	1	34756	1	32570	3	32578	4
34470	1	34758	1	32571	3	32579	4
34471	1	34759	1	32577	3	32583	4
34472	1	34761	1	32580	3	32625	4
34473	1	34762	1	00053	4	32648	4
34474	1	34769	1	00097	4	32754	4
34475	1	34771	1	00098	4	32759	4
34476	1	34772	1	32034	4	32780	4
34479	1	34773	1	32080	4	32796	4
34480	1	34785	1	32081	4	32815	4
34481	1	34786	1	32082	4	32901	4
34482	1	34787	1	32084	4	32904	4
34484	1	34788	1	32086	4	32905	4
34488	1	34797	1	32095	4	32907	4
34491	1	34972	1	32114	4	32908	4
34498	1	34974	1	32117	4	32909	4
34601	1	32346	2	32119	4	32922	4
34602	1	32322	3	32127	4	32926	4
34604	1	32404	3	32128	4	32927	4
34606	1	32405	3	32129	4	32934	4
34607	1	32409	3	32132	4	32935	4
34608	1	32437	3	32136	4	32940	4
34609	1	32439	3	32137	4	32948	4
34610	1	32444	3	32141	4	32949	4
34613	1	32459	3	32164	4	32950	4
34614	1	32465	3	32168	4	32953	4
34637	1	32466	3	32174	4	32955	4
34638	1	32501	3	32176	4	32958	4
34639	1	32503	3	32224	4	32960	4
34654	1	32504	3	32225	4	32962	4
34669	1	32505	3	32227	4	32966	4
34705	1	32506	3	32233	4	32967	4
34711	1	32507	3	32250	4	32968	4
34714	1	32514	3	32266	4	32976	4
34715	1	32526	3	32320	4	33401	4
34731	1	32531	3	32359	4	33403	4
34734	1	32533	3	32401	4	33404	4
34736	1	32534	3	32403	4	33405	4
34737	1	32535	3	32407	4	33406	4
34739	1	32536	3	32408	4	33407	4
34741	1	32539	3	32413	4	33408	4
34743	1	32542	3	32456	4	33409	4
34744	1	32547	3	32502	4	33410	4
34746	1	32564	3	32508	4	33411	4
34747	1	32565	3	32541	4	33412	4
34748	1	32566	3	32548	4	33413	4

ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001
33414	4	33712	4	33971	4	34240	4
33415	4	33713	4	33980	4	34241	4
33417	4	33714	4	33981	4	34243	4
33418	4	33716	4	33990	4	34275	4
33426	4	33755	4	33991	4	34285	4
33428	4	33756	4	33993	4	34286	4
33430	4	33759	4	34102	4	34287	4
33431	4	33760	4	34103	4	34288	4
33432	4	33761	4	34104	4	34289	4
33433	4	33762	4	34105	4	34292	4
33434	4	33763	4	34108	4	34293	4
33435	4	33764	4	34109	4	34652	4
33436	4	33765	4	34110	4	34653	4
33437	4	33770	4	34112	4	34655	4
33438	4	33771	4	34113	4	34667	4
33444	4	33772	4	34114	4	34668	4
33445	4	33773	4	34116	4	34677	4
33446	4	33774	4	34117	4	34683	4
33455	4	33776	4	34119	4	34684	4
33458	4	33777	4	34120	4	34685	4
33460	4	33778	4	34134	4	34688	4
33461	4	33781	4	34135	4	34689	4
33462	4	33782	4	34141	4	34690	4
33463	4	33901	4	34201	4	34691	4
33467	4	33903	4	34202	4	34695	4
33469	4	33904	4	34203	4	34698	4
33470	4	33905	4	34205	4	34945	4
33476	4	33907	4	34207	4	34946	4
33477	4	33908	4	34208	4	34947	4
33478	4	33909	4	34209	4	34950	4
33483	4	33912	4	34210	4	34951	4
33484	4	33913	4	34211	4	34952	4
33486	4	33914	4	34212	4	34953	4
33487	4	33916	4	34219	4	34956	4
33493	4	33917	4	34221	4	34981	4
33496	4	33919	4	34222	4	34982	4
33498	4	33927	4	34223	4	34983	4
33626	4	33928	4	34224	4	34984	4
33635	4	33947	4	34229	4	34986	4
33701	4	33948	4	34231	4	34987	4
33702	4	33950	4	34232	4	34988	4
33703	4	33952	4	34233	4	34990	4
33704	4	33953	4	34234	4	34994	4
33707	4	33954	4	34235	4	34996	4
33709	4	33955	4	34237	4	34997	4
33710	4	33966	4	34238	4	32118	5
33711	4	33967	4	34239	4	32169	5

ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001	ZIP Code	Region Post-2001
32328	5	33010	6	33131	6	33186	6
32544	5	33012	6	33132	6	33187	6
32550	5	33013	6	33133	6	33189	6
32561	5	33014	6	33134	6	33190	6
32569	5	33015	6	33135	6	33193	6
32903	5	33016	6	33136	6	33194	6
32920	5	33018	6	33137	6	33196	6
32925	5	33019	6	33138	6	33199	6
32931	5	33020	6	33139	6	33301	6
32937	5	33021	6	33140	6	33304	6
32951	5	33023	6	33141	6	33305	6
32952	5	33024	6	33142	6	33306	6
32963	5	33025	6	33143	6	33308	6
33036	5	33026	6	33144	6	33309	6
33037	5	33027	6	33145	6	33311	6
33040	5	33028	6	33146	6	33312	6
33042	5	33029	6	33147	6	33313	6
33043	5	33030	6	33149	6	33314	6
33050	5	33031	6	33150	6	33315	6
33070	5	33032	6	33154	6	33316	6
33480	5	33033	6	33155	6	33317	6
33705	5	33034	6	33156	6	33319	6
33706	5	33035	6	33157	6	33321	6
33708	5	33039	6	33158	6	33322	6
33715	5	33054	6	33160	6	33323	6
33767	5	33055	6	33161	6	33324	6
33785	5	33056	6	33162	6	33325	6
33786	5	33060	6	33165	6	33326	6
33921	5	33062	6	33166	6	33327	6
33922	5	33063	6	33167	6	33328	6
33924	5	33064	6	33168	6	33330	6
33931	5	33065	6	33169	6	33331	6
33946	5	33066	6	33170	6	33332	6
33956	5	33067	6	33172	6	33334	6
33957	5	33068	6	33173	6	33351	6
34145	5	33069	6	33174	6	33441	6
34215	5	33071	6	33175	6	33442	6
34217	5	33073	6	33176	6		
34228	5	33076	6	33177	6		
34236	5	33109	6	33178	6		
34242	5	33122	6	33179	6		
34949	5	33125	6	33180	6		
34957	5	33126	6	33181	6		
00041	6	33127	6	33182	6		
00043	6	33128	6	33183	6		
33004	6	33129	6	33184	6		
33009	6	33130	6	33185	6		

Year Built	Number of Stories	Loss Costs	Relative to Low-Rise	Relative to Pre-2002
Pre-2002	Low-rise (1-3)	1.832		
	Mid-High (4+)	0.649	0.35	
Post-2001	Low-rise (1-3)	1.273		0.69
	Mid-High (4+)	0.441	0.35	0.68

Year Built	Number of Stories	Construction Type Group	Loss Costs	Relativity to Exh. 12
Pre-2002	Low-rise (1-3)	Light Metal	3.573	1.95
		Wood Frame	2.621	1.43
		Joisted Masonry	1.868	1.02
		Masonry/Unreinforced Masonry	1.603	0.88
		Reinforced Masonry	0.902	0.49
		Reinforced Concrete	0.770	0.42
	Mid-Rise (4-7)	Joisted Masonry	1.448	2.23
		Reinforced Masonry	0.775	1.20
		Reinforced Concrete	0.516	0.80
		Steel	0.506	0.78
	High-rise (8+)	Reinforced Concrete	0.388	0.60
		Steel	0.381	0.59

Year Built	Number of Stories	Construction Type Group	Loss Costs - Regions						Relativity	
			1	2+3	4	5	6	Statewide	to Exh. 12	to Pre-2002
Post-2001	Low-rise (1-3)	Light Metal	1.189	2.252	3.114	7.043	7.932	3.049	2.40	0.85
		Wood Frame	0.697	1.392	1.932	4.401	4.111	1.839	1.44	0.70
		Joisted Masonry	0.513	1.060	1.465	3.451	3.621	1.430	1.12	0.77
		Masonry/Unreinforced Masonry	0.457	0.972	1.346	3.269	3.586	1.336	1.05	0.83
		Reinforced Masonry	0.262	0.543	0.752	1.806	1.935	0.743	0.58	0.82
		Reinforced Concrete	0.225	0.466	0.645	1.553	1.670	0.639	0.50	0.83
	Mid-Rise (4-7)	Joisted Masonry	0.399	0.817	1.130	2.662	2.778	1.104	2.50	0.76
		Reinforced Masonry	0.225	0.466	0.646	1.554	1.664	0.638	1.45	0.82
		Reinforced Concrete	0.150	0.311	0.431	1.043	1.120	0.427	0.97	0.83
		Steel	0.144	0.304	0.422	1.029	1.105	0.419	0.95	0.83
	High-rise (8+)	Reinforced Concrete	0.112	0.233	0.324	0.785	0.842	0.321	0.73	0.83
		Steel	0.108	0.228	0.317	0.775	0.831	0.315	0.71	0.83

Base Case

Low-Rise (1-3)	Pre-2002	Light Metal

				Loss Costs			**Relativities**		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Gable end without bracing	Nails/Screws	Screws/bolts	Light Metal Panels	4.084	3.836	3.683	1.14	1.07	1.03
			Asphalt Shingles	3.894	3.636	3.476	1.09	1.02	0.97
			FBC Equivalent	3.703	3.435	3.268	1.04	0.96	0.91
		Structurally connected	Light Metal Panels	4.074	3.825	3.672	1.14	1.07	1.03
			Asphalt Shingles	3.881	3.623	3.462	1.09	1.01	0.97
			FBC Equivalent	3.686	3.417	3.250	1.03	0.96	0.91
	Anchor bolts	Screws/bolts	Light Metal Panels	3.960	3.704	3.545	1.11	1.04	0.99
			Asphalt Shingles	3.764	3.498	3.331	1.05	0.98	0.93
			FBC Equivalent	3.568	3.290	3.116	1.00	0.92	0.87
		Structurally connected	Light Metal Panels	3.949	3.693	3.533	1.11	1.03	0.99
			Asphalt Shingles	3.751	3.484	3.317	1.05	0.97	0.93
			FBC Equivalent	3.551	3.272	3.097	0.99	0.92	0.87
Gable end with bracing	Nails/Screws	Screws/bolts	Light Metal Panels	3.761	3.496	3.330	1.05	0.98	0.93
			Asphalt Shingles	3.617	3.343	3.172	1.01	0.94	0.89
			FBC Equivalent	3.473	3.190	3.013	0.97	0.89	0.84
		Structurally connected	Light Metal Panels	3.753	3.487	3.321	1.05	0.98	0.93
			Asphalt Shingles	3.607	3.333	3.161	1.01	0.93	0.88
			FBC Equivalent	3.460	3.177	2.999	0.97	0.89	0.84
	Anchor bolts	Screws/bolts	Light Metal Panels	3.627	3.352	3.179	1.01	0.94	0.89
			Asphalt Shingles	3.478	3.194	3.015	0.97	0.89	0.84
			FBC Equivalent	3.330	3.036	2.850	0.93	0.85	0.80
		Structurally connected	Light Metal Panels	3.619	3.343	3.170	1.01	0.94	0.89
			Asphalt Shingles	3.468	3.183	3.003	0.97	0.89	0.84
			FBC Equivalent	3.317	3.022	2.835	0.93	0.85	0.79

Base Case

Low-Rise (1-3)	Pre-2002	Wood Frame

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Gable end without bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.783	2.597	2.481	1.06	0.99	0.95
			Asphalt Shingles	2.667	2.476	2.356	1.02	0.94	0.90
			FBC Equivalent	2.560	2.363	2.239	0.98	0.90	0.85
			Built-up roof without gravel	2.553	2.356	2.232	0.97	0.90	0.85
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.661	2.468	2.347	1.02	0.94	0.90
			Asphalt Shingles	2.521	2.321	2.195	0.96	0.89	0.84
			FBC Equivalent	2.382	2.174	2.043	0.91	0.83	0.78
			Built-up roof without gravel	2.372	2.164	2.033	0.91	0.83	0.78
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.661	2.468	2.347	1.02	0.94	0.90
			Asphalt Shingles	2.521	2.321	2.195	0.96	0.89	0.84
			FBC Equivalent	2.382	2.174	2.043	0.91	0.83	0.78
			Built-up roof without gravel	2.372	2.164	2.033	0.91	0.83	0.78
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.683	2.491	2.370	1.02	0.95	0.90
			Asphalt Shingles	2.564	2.366	2.241	0.98	0.90	0.86
			FBC Equivalent	2.454	2.250	2.121	0.94	0.86	0.81
			Built-up roof without gravel	2.447	2.243	2.114	0.93	0.86	0.81
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.556	2.357	2.231	0.98	0.90	0.85
			Asphalt Shingles	2.412	2.205	2.074	0.92	0.84	0.79
			FBC Equivalent	2.269	2.054	1.916	0.87	0.78	0.73
			Built-up roof without gravel	2.259	2.043	1.906	0.86	0.78	0.73
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.556	2.357	2.231	0.98	0.90	0.85
			Asphalt Shingles	2.412	2.205	2.074	0.92	0.84	0.79
			FBC Equivalent	2.269	2.054	1.916	0.87	0.78	0.73
			Built-up roof without gravel	2.259	2.043	1.906	0.86	0.78	0.73
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.646	2.451	2.329	1.01	0.94	0.89
			Asphalt Shingles	2.526	2.325	2.199	0.96	0.89	0.84
			FBC Equivalent	2.414	2.208	2.077	0.92	0.84	0.79
			Built-up roof without gravel	2.408	2.201	2.070	0.92	0.84	0.79
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.517	2.316	2.188	0.96	0.88	0.83
			Asphalt Shingles	2.371	2.161	2.028	0.90	0.82	0.77
			FBC Equivalent	2.227	2.008	1.868	0.85	0.77	0.71
			Built-up roof without gravel	2.217	1.998	1.857	0.85	0.76	0.71
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.517	2.316	2.188	0.96	0.88	0.83
			Asphalt Shingles	2.371	2.161	2.028	0.90	0.82	0.77
			FBC Equivalent	2.227	2.008	1.868	0.85	0.77	0.71
			Built-up roof without gravel	2.217	1.998	1.857	0.85	0.76	0.71
Gable end with bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.509	2.309	2.183	0.96	0.88	0.83
			Asphalt Shingles	2.422	2.217	2.087	0.92	0.85	0.80
			FBC Equivalent	2.340	2.131	1.998	0.89	0.81	0.76
			Built-up roof without gravel	2.336	2.126	1.993	0.89	0.81	0.76
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.417	2.211	2.081	0.92	0.84	0.79
			Asphalt Shingles	2.311	2.099	1.964	0.88	0.80	0.75
			FBC Equivalent	2.207	1.988	1.849	0.84	0.76	0.71
			Built-up roof without gravel	2.200	1.981	1.842	0.84	0.76	0.70
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.417	2.211	2.081	0.92	0.84	0.79
			Asphalt Shingles	2.311	2.099	1.964	0.88	0.80	0.75
			FBC Equivalent	2.207	1.988	1.849	0.84	0.76	0.71
			Built-up roof without gravel	2.200	1.981	1.842	0.84	0.76	0.70
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.401	2.193	2.062	0.92	0.84	0.79
			Asphalt Shingles	2.310	2.098	1.962	0.88	0.80	0.75
			FBC Equivalent	2.227	2.009	1.870	0.85	0.77	0.71
			Built-up roof without gravel	2.222	2.004	1.864	0.85	0.76	0.71
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.305	2.091	1.954	0.88	0.80	0.75
			Asphalt Shingles	2.195	1.975	1.833	0.84	0.75	0.70
			FBC Equivalent	2.088	1.860	1.714	0.80	0.71	0.65
			Built-up roof without gravel	2.081	1.852	1.705	0.79	0.71	0.65
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.305	2.091	1.954	0.88	0.80	0.75
			Asphalt Shingles	2.195	1.975	1.833	0.84	0.75	0.70
			FBC Equivalent	2.088	1.860	1.714	0.80	0.71	0.65
			Built-up roof without gravel	2.081	1.852	1.705	0.79	0.71	0.65
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.360	2.150	2.016	0.90	0.82	0.77
			Asphalt Shingles	2.269	2.053	1.915	0.87	0.78	0.73
			FBC Equivalent	2.184	1.963	1.822	0.83	0.75	0.70
			Built-up roof without gravel	2.179	1.958	1.816	0.83	0.75	0.69
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.262	2.045	1.906	0.86	0.78	0.73
			Asphalt Shingles	2.152	1.928	1.784	0.82	0.74	0.68
			FBC Equivalent	2.043	1.811	1.662	0.78	0.69	0.63
			Built-up roof without gravel	2.036	1.804	1.654	0.78	0.69	0.63
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.262	2.045	1.906	0.86	0.78	0.73
			Asphalt Shingles	2.152	1.928	1.784	0.82	0.74	0.68
			FBC Equivalent	2.043	1.811	1.662	0.78	0.69	0.63
			Built-up roof without gravel	2.036	1.804	1.654	0.78	0.69	0.63

Base Case

Low-Rise (1-3)	Pre-2002	Wood Frame

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Hip	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.386	2.179	2.047	0.91	0.83	0.78
			Asphalt Shingles	2.311	2.100	1.965	0.88	0.80	0.75
			FBC Equivalent	2.242	2.026	1.889	0.86	0.77	0.72
			Built-up roof without gravel	2.238	2.022	1.884	0.85	0.77	0.72
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.307	2.095	1.959	0.88	0.80	0.75
			Asphalt Shingles	2.218	1.999	1.860	0.85	0.76	0.71
			FBC Equivalent	2.129	1.906	1.762	0.81	0.73	0.67
			Built-up roof without gravel	2.124	1.899	1.756	0.81	0.72	0.67
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.307	2.095	1.959	0.88	0.80	0.75
			Asphalt Shingles	2.218	1.999	1.860	0.85	0.76	0.71
			FBC Equivalent	2.129	1.906	1.762	0.81	0.73	0.67
			Built-up roof without gravel	2.124	1.899	1.756	0.81	0.72	0.67
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.273	2.058	1.921	0.87	0.79	0.73
			Asphalt Shingles	2.196	1.976	1.835	0.84	0.75	0.70
			FBC Equivalent	2.125	1.900	1.756	0.81	0.72	0.67
			Built-up roof without gravel	2.121	1.896	1.751	0.81	0.72	0.67
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.191	1.970	1.828	0.84	0.75	0.70
			Asphalt Shingles	2.098	1.871	1.725	0.80	0.71	0.66
			FBC Equivalent	2.007	1.773	1.622	0.77	0.68	0.62
			Built-up roof without gravel	2.001	1.767	1.615	0.76	0.67	0.62
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.191	1.970	1.828	0.84	0.75	0.70
			Asphalt Shingles	2.098	1.871	1.725	0.80	0.71	0.66
			FBC Equivalent	2.007	1.773	1.622	0.77	0.68	0.62
			Built-up roof without gravel	2.001	1.767	1.615	0.76	0.67	0.62
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.231	2.013	1.873	0.85	0.77	0.71
			Asphalt Shingles	2.153	1.929	1.786	0.82	0.74	0.68
			FBC Equivalent	2.081	1.852	1.705	0.79	0.71	0.65
			Built-up roof without gravel	2.077	1.848	1.701	0.79	0.71	0.65
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.147	1.923	1.778	0.82	0.73	0.68
			Asphalt Shingles	2.053	1.822	1.672	0.78	0.70	0.64
			FBC Equivalent	1.961	1.723	1.569	0.75	0.66	0.60
			Built-up roof without gravel	1.955	1.716	1.561	0.75	0.65	0.60
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.147	1.923	1.778	0.82	0.73	0.68
			Asphalt Shingles	2.053	1.822	1.672	0.78	0.70	0.64
			FBC Equivalent	1.961	1.723	1.569	0.75	0.66	0.60
			Built-up roof without gravel	1.955	1.716	1.561	0.75	0.65	0.60

Base Case

Low-Rise (1-3)	Pre-2002	Joisted Masonry

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Gable end without bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.109	1.973	1.887	1.13	1.06	1.01
			Asphalt Shingles	2.026	1.887	1.799	1.08	1.01	0.96
			FBC Equivalent	1.950	1.807	1.716	1.04	0.97	0.92
			Built-up roof without gravel	1.945	1.802	1.711	1.04	0.96	0.92
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	2.018	1.878	1.790	1.08	1.01	0.96
			Asphalt Shingles	1.918	1.773	1.681	1.03	0.95	0.90
			FBC Equivalent	1.819	1.669	1.573	0.97	0.89	0.84
			Built-up roof without gravel	1.812	1.662	1.566	0.97	0.89	0.84
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	2.018	1.878	1.790	1.08	1.01	0.96
			Asphalt Shingles	1.918	1.773	1.681	1.03	0.95	0.90
			FBC Equivalent	1.819	1.669	1.573	0.97	0.89	0.84
			Built-up roof without gravel	1.812	1.662	1.566	0.97	0.89	0.84
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.033	1.893	1.805	1.09	1.01	0.97
			Asphalt Shingles	1.949	1.805	1.714	1.04	0.97	0.92
			FBC Equivalent	1.871	1.723	1.629	1.00	0.92	0.87
			Built-up roof without gravel	1.866	1.718	1.624	1.00	0.92	0.87
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.940	1.795	1.703	1.04	0.96	0.91
			Asphalt Shingles	1.837	1.686	1.591	0.98	0.90	0.85
			FBC Equivalent	1.735	1.579	1.480	0.93	0.85	0.79
			Built-up roof without gravel	1.728	1.572	1.472	0.93	0.84	0.79
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.940	1.795	1.703	1.04	0.96	0.91
			Asphalt Shingles	1.837	1.686	1.591	0.98	0.90	0.85
			FBC Equivalent	1.735	1.579	1.480	0.93	0.85	0.79
			Built-up roof without gravel	1.728	1.572	1.472	0.93	0.84	0.79
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	2.005	1.863	1.774	1.07	1.00	0.95
			Asphalt Shingles	1.920	1.774	1.682	1.03	0.95	0.90
			FBC Equivalent	1.841	1.691	1.596	0.99	0.91	0.85
			Built-up roof without gravel	1.836	1.686	1.591	0.98	0.90	0.85
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.910	1.764	1.671	1.02	0.94	0.89
			Asphalt Shingles	1.806	1.654	1.557	0.97	0.89	0.83
			FBC Equivalent	1.704	1.546	1.444	0.91	0.83	0.77
			Built-up roof without gravel	1.697	1.538	1.436	0.91	0.82	0.77
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.910	1.764	1.671	1.02	0.94	0.89
			Asphalt Shingles	1.806	1.654	1.557	0.97	0.89	0.83
			FBC Equivalent	1.704	1.546	1.444	0.91	0.83	0.77
			Built-up roof without gravel	1.697	1.538	1.436	0.91	0.82	0.77
Gable end with bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.910	1.765	1.673	1.02	0.94	0.90
			Asphalt Shingles	1.848	1.699	1.605	0.99	0.91	0.86
			FBC Equivalent	1.791	1.639	1.542	0.96	0.88	0.83
			Built-up roof without gravel	1.787	1.635	1.539	0.96	0.88	0.82
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.842	1.693	1.598	0.99	0.91	0.86
			Asphalt Shingles	1.767	1.614	1.516	0.95	0.86	0.81
			FBC Equivalent	1.694	1.535	1.434	0.91	0.82	0.77
			Built-up roof without gravel	1.689	1.530	1.429	0.90	0.82	0.77
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.842	1.693	1.598	0.99	0.91	0.86
			Asphalt Shingles	1.767	1.614	1.516	0.95	0.86	0.81
			FBC Equivalent	1.694	1.535	1.434	0.91	0.82	0.77
			Built-up roof without gravel	1.689	1.530	1.429	0.90	0.82	0.77
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.829	1.679	1.583	0.98	0.90	0.85
			Asphalt Shingles	1.765	1.611	1.513	0.95	0.86	0.81
			FBC Equivalent	1.706	1.549	1.448	0.91	0.83	0.78
			Built-up roof without gravel	1.703	1.545	1.444	0.91	0.83	0.77
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.759	1.604	1.505	0.94	0.86	0.81
			Asphalt Shingles	1.681	1.522	1.419	0.90	0.81	0.76
			FBC Equivalent	1.605	1.441	1.335	0.86	0.77	0.71
			Built-up roof without gravel	1.600	1.435	1.329	0.86	0.77	0.71
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.759	1.604	1.505	0.94	0.86	0.81
			Asphalt Shingles	1.681	1.522	1.419	0.90	0.81	0.76
			FBC Equivalent	1.605	1.441	1.335	0.86	0.77	0.71
			Built-up roof without gravel	1.600	1.435	1.329	0.86	0.77	0.71
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.799	1.646	1.549	0.96	0.88	0.83
			Asphalt Shingles	1.734	1.578	1.478	0.93	0.84	0.79
			FBC Equivalent	1.675	1.515	1.412	0.90	0.81	0.76
			Built-up roof without gravel	1.671	1.511	1.408	0.89	0.81	0.75
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.727	1.570	1.469	0.92	0.84	0.79
			Asphalt Shingles	1.649	1.487	1.382	0.88	0.80	0.74
			FBC Equivalent	1.572	1.405	1.297	0.84	0.75	0.69
			Built-up roof without gravel	1.567	1.399	1.291	0.84	0.75	0.69
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.727	1.570	1.469	0.92	0.84	0.79
			Asphalt Shingles	1.649	1.487	1.382	0.88	0.80	0.74
			FBC Equivalent	1.572	1.405	1.297	0.84	0.75	0.69
			Built-up roof without gravel	1.567	1.399	1.291	0.84	0.75	0.69

Base Case

Low-Rise (1-3)	Pre-2002	Joisted Masonry

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Hip	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.821	1.671	1.576	0.98	0.89	0.84
			Asphalt Shingles	1.769	1.615	1.518	0.95	0.86	0.81
			FBC Equivalent	1.720	1.564	1.464	0.92	0.84	0.78
			Built-up roof without gravel	1.717	1.561	1.461	0.92	0.84	0.78
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.764	1.610	1.511	0.94	0.86	0.81
			Asphalt Shingles	1.700	1.542	1.441	0.91	0.83	0.77
			FBC Equivalent	1.638	1.476	1.372	0.88	0.79	0.73
			Built-up roof without gravel	1.634	1.472	1.368	0.87	0.79	0.73
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.764	1.610	1.511	0.94	0.86	0.81
			Asphalt Shingles	1.700	1.542	1.441	0.91	0.83	0.77
			FBC Equivalent	1.638	1.476	1.372	0.88	0.79	0.73
			Built-up roof without gravel	1.634	1.472	1.368	0.87	0.79	0.73
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.737	1.582	1.482	0.93	0.85	0.79
			Asphalt Shingles	1.683	1.524	1.422	0.90	0.82	0.76
			FBC Equivalent	1.633	1.471	1.366	0.87	0.79	0.73
			Built-up roof without gravel	1.630	1.468	1.363	0.87	0.79	0.73
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.677	1.517	1.415	0.90	0.81	0.76
			Asphalt Shingles	1.612	1.447	1.342	0.86	0.78	0.72
			FBC Equivalent	1.547	1.379	1.270	0.83	0.74	0.68
			Built-up roof without gravel	1.543	1.374	1.265	0.83	0.74	0.68
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.677	1.517	1.415	0.90	0.81	0.76
			Asphalt Shingles	1.612	1.447	1.342	0.86	0.78	0.72
			FBC Equivalent	1.547	1.379	1.270	0.83	0.74	0.68
			Built-up roof without gravel	1.543	1.374	1.265	0.83	0.74	0.68
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.706	1.548	1.447	0.91	0.83	0.77
			Asphalt Shingles	1.651	1.489	1.386	0.88	0.80	0.74
			FBC Equivalent	1.600	1.436	1.329	0.86	0.77	0.71
			Built-up roof without gravel	1.597	1.432	1.326	0.86	0.77	0.71
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.645	1.482	1.378	0.88	0.79	0.74
			Asphalt Shingles	1.578	1.411	1.303	0.85	0.76	0.70
			FBC Equivalent	1.513	1.342	1.230	0.81	0.72	0.66
			Built-up roof without gravel	1.509	1.337	1.225	0.81	0.72	0.66
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.645	1.482	1.378	0.88	0.79	0.74
			Asphalt Shingles	1.578	1.411	1.303	0.85	0.76	0.70
			FBC Equivalent	1.513	1.342	1.230	0.81	0.72	0.66
			Built-up roof without gravel	1.509	1.337	1.225	0.81	0.72	0.66

Base Case

Low-Rise (1-3)	Pre-2002	Masonry/Unreinforced Masonry

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Gable end without bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.937	1.820	1.747	1.21	1.14	1.09
			Asphalt Shingles	1.866	1.747	1.671	1.16	1.09	1.04
			FBC Equivalent	1.801	1.678	1.601	1.12	1.05	1.00
			Built-up roof without gravel	1.797	1.674	1.597	1.12	1.04	1.00
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.859	1.739	1.663	1.16	1.08	1.04
			Asphalt Shingles	1.773	1.649	1.570	1.11	1.03	0.98
			FBC Equivalent	1.689	1.560	1.478	1.05	0.97	0.92
			Built-up roof without gravel	1.683	1.554	1.472	1.05	0.97	0.92
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.859	1.739	1.663	1.16	1.08	1.04
			Asphalt Shingles	1.773	1.649	1.570	1.11	1.03	0.98
			FBC Equivalent	1.689	1.560	1.478	1.05	0.97	0.92
			Built-up roof without gravel	1.683	1.554	1.472	1.05	0.97	0.92
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.872	1.752	1.676	1.17	1.09	1.05
			Asphalt Shingles	1.799	1.676	1.598	1.12	1.05	1.00
			FBC Equivalent	1.733	1.606	1.526	1.08	1.00	0.95
			Built-up roof without gravel	1.728	1.602	1.521	1.08	1.00	0.95
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.791	1.668	1.589	1.12	1.04	0.99
			Asphalt Shingles	1.703	1.575	1.493	1.06	0.98	0.93
			FBC Equivalent	1.617	1.484	1.398	1.01	0.93	0.87
			Built-up roof without gravel	1.611	1.477	1.392	1.00	0.92	0.87
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.791	1.668	1.589	1.12	1.04	0.99
			Asphalt Shingles	1.703	1.575	1.493	1.06	0.98	0.93
			FBC Equivalent	1.617	1.484	1.398	1.01	0.93	0.87
			Built-up roof without gravel	1.611	1.477	1.392	1.00	0.92	0.87
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.847	1.726	1.650	1.15	1.08	1.03
			Asphalt Shingles	1.774	1.650	1.571	1.11	1.03	0.98
			FBC Equivalent	1.707	1.579	1.498	1.06	0.98	0.93
			Built-up roof without gravel	1.703	1.575	1.493	1.06	0.98	0.93
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.766	1.641	1.561	1.10	1.02	0.97
			Asphalt Shingles	1.677	1.547	1.464	1.05	0.96	0.91
			FBC Equivalent	1.590	1.455	1.368	0.99	0.91	0.85
			Built-up roof without gravel	1.584	1.448	1.361	0.99	0.90	0.85
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.766	1.641	1.561	1.10	1.02	0.97
			Asphalt Shingles	1.677	1.547	1.464	1.05	0.96	0.91
			FBC Equivalent	1.590	1.455	1.368	0.99	0.91	0.85
			Built-up roof without gravel	1.584	1.448	1.361	0.99	0.90	0.85
Gable end with bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.767	1.642	1.564	1.10	1.02	0.98
			Asphalt Shingles	1.714	1.586	1.506	1.07	0.99	0.94
			FBC Equivalent	1.665	1.535	1.452	1.04	0.96	0.91
			Built-up roof without gravel	1.662	1.532	1.449	1.04	0.96	0.90
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.709	1.581	1.500	1.07	0.99	0.94
			Asphalt Shingles	1.644	1.513	1.429	1.03	0.94	0.89
			FBC Equivalent	1.581	1.446	1.360	0.99	0.90	0.85
			Built-up roof without gravel	1.577	1.442	1.355	0.98	0.90	0.85
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.709	1.581	1.500	1.07	0.99	0.94
			Asphalt Shingles	1.644	1.513	1.429	1.03	0.94	0.89
			FBC Equivalent	1.581	1.446	1.360	0.99	0.90	0.85
			Built-up roof without gravel	1.577	1.442	1.355	0.98	0.90	0.85
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.697	1.568	1.487	1.06	0.98	0.93
			Asphalt Shingles	1.642	1.511	1.427	1.02	0.94	0.89
			FBC Equivalent	1.592	1.458	1.371	0.99	0.91	0.86
			Built-up roof without gravel	1.589	1.454	1.368	0.99	0.91	0.85
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.636	1.504	1.420	1.02	0.94	0.89
			Asphalt Shingles	1.570	1.434	1.347	0.98	0.89	0.84
			FBC Equivalent	1.506	1.365	1.275	0.94	0.85	0.80
			Built-up roof without gravel	1.501	1.360	1.270	0.94	0.85	0.79
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.636	1.504	1.420	1.02	0.94	0.89
			Asphalt Shingles	1.570	1.434	1.347	0.98	0.89	0.84
			FBC Equivalent	1.506	1.365	1.275	0.94	0.85	0.80
			Built-up roof without gravel	1.501	1.360	1.270	0.94	0.85	0.79
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.671	1.540	1.457	1.04	0.96	0.91
			Asphalt Shingles	1.616	1.482	1.397	1.01	0.92	0.87
			FBC Equivalent	1.565	1.428	1.341	0.98	0.89	0.84
			Built-up roof without gravel	1.562	1.425	1.337	0.97	0.89	0.83
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.609	1.475	1.389	1.00	0.92	0.87
			Asphalt Shingles	1.542	1.404	1.315	0.96	0.88	0.82
			FBC Equivalent	1.477	1.334	1.242	0.92	0.83	0.77
			Built-up roof without gravel	1.472	1.330	1.237	0.92	0.83	0.77
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.609	1.475	1.389	1.00	0.92	0.87
			Asphalt Shingles	1.542	1.404	1.315	0.96	0.88	0.82
			FBC Equivalent	1.477	1.334	1.242	0.92	0.83	0.77
			Built-up roof without gravel	1.472	1.330	1.237	0.92	0.83	0.77

Base Case

Low-Rise (1-3)	Pre-2002	Masonry/Unreinforced Masonry

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Hip	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.691	1.562	1.480	1.05	0.97	0.92
			Asphalt Shingles	1.646	1.514	1.431	1.03	0.94	0.89
			FBC Equivalent	1.604	1.471	1.385	1.00	0.92	0.86
			Built-up roof without gravel	1.602	1.468	1.383	1.00	0.92	0.86
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.641	1.509	1.426	1.02	0.94	0.89
			Asphalt Shingles	1.587	1.452	1.366	0.99	0.91	0.85
			FBC Equivalent	1.534	1.395	1.307	0.96	0.87	0.82
			Built-up roof without gravel	1.530	1.392	1.303	0.95	0.87	0.81
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.641	1.509	1.426	1.02	0.94	0.89
			Asphalt Shingles	1.587	1.452	1.366	0.99	0.91	0.85
			FBC Equivalent	1.534	1.395	1.307	0.96	0.87	0.82
			Built-up roof without gravel	1.530	1.392	1.303	0.95	0.87	0.81
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.619	1.485	1.400	1.01	0.93	0.87
			Asphalt Shingles	1.572	1.436	1.349	0.98	0.90	0.84
			FBC Equivalent	1.529	1.391	1.302	0.95	0.87	0.81
			Built-up roof without gravel	1.527	1.388	1.299	0.95	0.87	0.81
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.567	1.430	1.343	0.98	0.89	0.84
			Asphalt Shingles	1.511	1.371	1.280	0.94	0.85	0.80
			FBC Equivalent	1.456	1.312	1.219	0.91	0.82	0.76
			Built-up roof without gravel	1.452	1.308	1.215	0.91	0.82	0.76
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.567	1.430	1.343	0.98	0.89	0.84
			Asphalt Shingles	1.511	1.371	1.280	0.94	0.85	0.80
			FBC Equivalent	1.456	1.312	1.219	0.91	0.82	0.76
			Built-up roof without gravel	1.452	1.308	1.215	0.91	0.82	0.76
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.591	1.456	1.370	0.99	0.91	0.85
			Asphalt Shingles	1.544	1.407	1.318	0.96	0.88	0.82
			FBC Equivalent	1.501	1.361	1.270	0.94	0.85	0.79
			Built-up roof without gravel	1.499	1.358	1.267	0.93	0.85	0.79
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.539	1.400	1.311	0.96	0.87	0.82
			Asphalt Shingles	1.482	1.340	1.248	0.92	0.84	0.78
			FBC Equivalent	1.427	1.281	1.186	0.89	0.80	0.74
			Built-up roof without gravel	1.423	1.276	1.181	0.89	0.80	0.74
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.539	1.400	1.311	0.96	0.87	0.82
			Asphalt Shingles	1.482	1.340	1.248	0.92	0.84	0.78
			FBC Equivalent	1.427	1.281	1.186	0.89	0.80	0.74
			Built-up roof without gravel	1.423	1.276	1.181	0.89	0.80	0.74

Base Case

Low-Rise (1-3)	Pre-2002	Reinforced Masonry

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Gable end without bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.094	1.025	0.982	1.21	1.14	1.09
			Asphalt Shingles	1.052	0.982	0.938	1.17	1.09	1.04
			FBC Equivalent	1.014	0.942	0.896	1.12	1.04	0.99
			Built-up roof without gravel	1.011	0.939	0.894	1.12	1.04	0.99
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.048	0.977	0.933	1.16	1.08	1.03
			Asphalt Shingles	0.998	0.925	0.879	1.11	1.03	0.97
			FBC Equivalent	0.948	0.873	0.825	1.05	0.97	0.91
			Built-up roof without gravel	0.945	0.869	0.821	1.05	0.96	0.91
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.048	0.977	0.933	1.16	1.08	1.03
			Asphalt Shingles	0.998	0.925	0.879	1.11	1.03	0.97
			FBC Equivalent	0.948	0.873	0.825	1.05	0.97	0.91
			Built-up roof without gravel	0.945	0.869	0.821	1.05	0.96	0.91
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.055	0.985	0.941	1.17	1.09	1.04
			Asphalt Shingles	1.013	0.941	0.895	1.12	1.04	0.99
			FBC Equivalent	0.974	0.900	0.853	1.08	1.00	0.95
			Built-up roof without gravel	0.971	0.897	0.850	1.08	0.99	0.94
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	1.008	0.936	0.890	1.12	1.04	0.99
			Asphalt Shingles	0.957	0.882	0.834	1.06	0.98	0.92
			FBC Equivalent	0.906	0.828	0.779	1.00	0.92	0.86
			Built-up roof without gravel	0.902	0.824	0.775	1.00	0.91	0.86
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	1.008	0.936	0.890	1.12	1.04	0.99
			Asphalt Shingles	0.957	0.882	0.834	1.06	0.98	0.92
			FBC Equivalent	0.906	0.828	0.779	1.00	0.92	0.86
			Built-up roof without gravel	0.902	0.824	0.775	1.00	0.91	0.86
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	1.041	0.970	0.925	1.15	1.08	1.03
			Asphalt Shingles	0.998	0.925	0.879	1.11	1.03	0.97
			FBC Equivalent	0.959	0.884	0.837	1.06	0.98	0.93
			Built-up roof without gravel	0.956	0.881	0.834	1.06	0.98	0.92
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.994	0.920	0.874	1.10	1.02	0.97
			Asphalt Shingles	0.941	0.866	0.817	1.04	0.96	0.91
			FBC Equivalent	0.890	0.812	0.762	0.99	0.90	0.84
			Built-up roof without gravel	0.887	0.808	0.758	0.98	0.90	0.84
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.994	0.920	0.874	1.10	1.02	0.97
			Asphalt Shingles	0.941	0.866	0.817	1.04	0.96	0.91
			FBC Equivalent	0.890	0.812	0.762	0.99	0.90	0.84
			Built-up roof without gravel	0.887	0.808	0.758	0.98	0.90	0.84
Gable end with bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.994	0.921	0.875	1.10	1.02	0.97
			Asphalt Shingles	0.963	0.888	0.841	1.07	0.98	0.93
			FBC Equivalent	0.934	0.858	0.810	1.04	0.95	0.90
			Built-up roof without gravel	0.932	0.856	0.808	1.03	0.95	0.90
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.959	0.885	0.837	1.06	0.98	0.93
			Asphalt Shingles	0.922	0.845	0.796	1.02	0.94	0.88
			FBC Equivalent	0.885	0.806	0.756	0.98	0.89	0.84
			Built-up roof without gravel	0.882	0.803	0.753	0.98	0.89	0.84
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.959	0.885	0.837	1.06	0.98	0.93
			Asphalt Shingles	0.922	0.845	0.796	1.02	0.94	0.88
			FBC Equivalent	0.885	0.806	0.756	0.98	0.89	0.84
			Built-up roof without gravel	0.882	0.803	0.753	0.98	0.89	0.84
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.953	0.878	0.830	1.06	0.97	0.92
			Asphalt Shingles	0.921	0.844	0.795	1.02	0.94	0.88
			FBC Equivalent	0.891	0.813	0.763	0.99	0.90	0.85
			Built-up roof without gravel	0.890	0.811	0.761	0.99	0.90	0.84
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.918	0.840	0.791	1.02	0.93	0.88
			Asphalt Shingles	0.879	0.800	0.749	0.97	0.89	0.83
			FBC Equivalent	0.841	0.759	0.707	0.93	0.84	0.78
			Built-up roof without gravel	0.838	0.757	0.704	0.93	0.84	0.78
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.918	0.840	0.791	1.02	0.93	0.88
			Asphalt Shingles	0.879	0.800	0.749	0.97	0.89	0.83
			FBC Equivalent	0.841	0.759	0.707	0.93	0.84	0.78
			Built-up roof without gravel	0.838	0.757	0.704	0.93	0.84	0.78
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.938	0.862	0.813	1.04	0.96	0.90
			Asphalt Shingles	0.905	0.828	0.778	1.00	0.92	0.86
			FBC Equivalent	0.876	0.796	0.746	0.97	0.88	0.83
			Built-up roof without gravel	0.874	0.794	0.744	0.97	0.88	0.82
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.902	0.824	0.774	1.00	0.91	0.86
			Asphalt Shingles	0.863	0.782	0.731	0.96	0.87	0.81
			FBC Equivalent	0.825	0.742	0.689	0.91	0.82	0.76
			Built-up roof without gravel	0.822	0.739	0.686	0.91	0.82	0.76
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.902	0.824	0.774	1.00	0.91	0.86
			Asphalt Shingles	0.863	0.782	0.731	0.96	0.87	0.81
			FBC Equivalent	0.825	0.742	0.689	0.91	0.82	0.76
			Built-up roof without gravel	0.822	0.739	0.686	0.91	0.82	0.76

Base Case

Low-Rise (1-3)	Pre-2002	Reinforced Masonry

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Hip	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.949	0.874	0.826	1.05	0.97	0.92
			Asphalt Shingles	0.923	0.846	0.797	1.02	0.94	0.88
			FBC Equivalent	0.898	0.820	0.771	1.00	0.91	0.85
			Built-up roof without gravel	0.897	0.819	0.769	0.99	0.91	0.85
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.920	0.843	0.794	1.02	0.93	0.88
			Asphalt Shingles	0.888	0.809	0.759	0.98	0.90	0.84
			FBC Equivalent	0.857	0.777	0.725	0.95	0.86	0.80
			Built-up roof without gravel	0.855	0.774	0.723	0.95	0.86	0.80
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.920	0.843	0.794	1.02	0.93	0.88
			Asphalt Shingles	0.888	0.809	0.759	0.98	0.90	0.84
			FBC Equivalent	0.857	0.777	0.725	0.95	0.86	0.80
			Built-up roof without gravel	0.855	0.774	0.723	0.95	0.86	0.80
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.907	0.829	0.780	1.01	0.92	0.86
			Asphalt Shingles	0.880	0.801	0.750	0.98	0.89	0.83
			FBC Equivalent	0.855	0.774	0.723	0.95	0.86	0.80
			Built-up roof without gravel	0.853	0.773	0.721	0.95	0.86	0.80
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.877	0.798	0.747	0.97	0.88	0.83
			Asphalt Shingles	0.844	0.763	0.711	0.94	0.85	0.79
			FBC Equivalent	0.812	0.729	0.675	0.90	0.81	0.75
			Built-up roof without gravel	0.810	0.726	0.673	0.90	0.81	0.75
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.877	0.798	0.747	0.97	0.88	0.83
			Asphalt Shingles	0.844	0.763	0.711	0.94	0.85	0.79
			FBC Equivalent	0.812	0.729	0.675	0.90	0.81	0.75
			Built-up roof without gravel	0.810	0.726	0.673	0.90	0.81	0.75
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.891	0.813	0.763	0.99	0.90	0.85
			Asphalt Shingles	0.864	0.784	0.733	0.96	0.87	0.81
			FBC Equivalent	0.839	0.757	0.705	0.93	0.84	0.78
			Built-up roof without gravel	0.837	0.755	0.703	0.93	0.84	0.78
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.861	0.780	0.729	0.95	0.87	0.81
			Asphalt Shingles	0.828	0.745	0.692	0.92	0.83	0.77
			FBC Equivalent	0.795	0.711	0.656	0.88	0.79	0.73
			Built-up roof without gravel	0.793	0.708	0.654	0.88	0.79	0.72
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.861	0.780	0.729	0.95	0.87	0.81
			Asphalt Shingles	0.828	0.745	0.692	0.92	0.83	0.77
			FBC Equivalent	0.795	0.711	0.656	0.88	0.79	0.73
			Built-up roof without gravel	0.793	0.708	0.654	0.88	0.79	0.72

Base Case

Low-Rise (1-3)	Pre-2002	Reinforced Concrete

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Gable end without bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.938	0.879	0.842	1.22	1.14	1.09
			Asphalt Shingles	0.903	0.842	0.804	1.17	1.09	1.04
			FBC Equivalent	0.870	0.808	0.769	1.13	1.05	1.00
			Built-up roof without gravel	0.868	0.806	0.767	1.13	1.05	1.00
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.899	0.838	0.800	1.17	1.09	1.04
			Asphalt Shingles	0.856	0.793	0.754	1.11	1.03	0.98
			FBC Equivalent	0.813	0.748	0.708	1.06	0.97	0.92
			Built-up roof without gravel	0.810	0.745	0.704	1.05	0.97	0.91
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.899	0.838	0.800	1.17	1.09	1.04
			Asphalt Shingles	0.856	0.793	0.754	1.11	1.03	0.98
			FBC Equivalent	0.813	0.748	0.708	1.06	0.97	0.92
			Built-up roof without gravel	0.810	0.745	0.704	1.05	0.97	0.91
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.905	0.845	0.807	1.18	1.10	1.05
			Asphalt Shingles	0.869	0.807	0.768	1.13	1.05	1.00
			FBC Equivalent	0.835	0.772	0.732	1.08	1.00	0.95
			Built-up roof without gravel	0.833	0.769	0.729	1.08	1.00	0.95
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.865	0.803	0.763	1.12	1.04	0.99
			Asphalt Shingles	0.820	0.756	0.715	1.07	0.98	0.93
			FBC Equivalent	0.777	0.710	0.668	1.01	0.92	0.87
			Built-up roof without gravel	0.774	0.707	0.665	1.00	0.92	0.86
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.865	0.803	0.763	1.12	1.04	0.99
			Asphalt Shingles	0.820	0.756	0.715	1.07	0.98	0.93
			FBC Equivalent	0.777	0.710	0.668	1.01	0.92	0.87
			Built-up roof without gravel	0.774	0.707	0.665	1.00	0.92	0.86
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.893	0.832	0.794	1.16	1.08	1.03
			Asphalt Shingles	0.856	0.794	0.754	1.11	1.03	0.98
			FBC Equivalent	0.822	0.758	0.718	1.07	0.98	0.93
			Built-up roof without gravel	0.820	0.756	0.715	1.06	0.98	0.93
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.852	0.789	0.750	1.11	1.02	0.97
			Asphalt Shingles	0.807	0.742	0.701	1.05	0.96	0.91
			FBC Equivalent	0.763	0.696	0.653	0.99	0.90	0.85
			Built-up roof without gravel	0.760	0.693	0.650	0.99	0.90	0.84
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.852	0.789	0.750	1.11	1.02	0.97
			Asphalt Shingles	0.807	0.742	0.701	1.05	0.96	0.91
			FBC Equivalent	0.763	0.696	0.653	0.99	0.90	0.85
			Built-up roof without gravel	0.760	0.693	0.650	0.99	0.90	0.84
Gable end with bracing	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.852	0.790	0.750	1.11	1.03	0.97
			Asphalt Shingles	0.826	0.762	0.721	1.07	0.99	0.94
			FBC Equivalent	0.801	0.736	0.694	1.04	0.96	0.90
			Built-up roof without gravel	0.799	0.734	0.693	1.04	0.95	0.90
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.823	0.759	0.718	1.07	0.99	0.93
			Asphalt Shingles	0.791	0.725	0.683	1.03	0.94	0.89
			FBC Equivalent	0.759	0.691	0.649	0.99	0.90	0.84
			Built-up roof without gravel	0.757	0.689	0.646	0.98	0.89	0.84
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.823	0.759	0.718	1.07	0.99	0.93
			Asphalt Shingles	0.791	0.725	0.683	1.03	0.94	0.89
			FBC Equivalent	0.759	0.691	0.649	0.99	0.90	0.84
			Built-up roof without gravel	0.757	0.689	0.646	0.98	0.89	0.84
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.817	0.753	0.712	1.06	0.98	0.92
			Asphalt Shingles	0.790	0.724	0.682	1.03	0.94	0.89
			FBC Equivalent	0.765	0.697	0.655	0.99	0.91	0.85
			Built-up roof without gravel	0.763	0.696	0.653	0.99	0.90	0.85
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.787	0.721	0.679	1.02	0.94	0.88
			Asphalt Shingles	0.754	0.686	0.643	0.98	0.89	0.83
			FBC Equivalent	0.721	0.651	0.607	0.94	0.85	0.79
			Built-up roof without gravel	0.719	0.649	0.604	0.93	0.84	0.78
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.787	0.721	0.679	1.02	0.94	0.88
			Asphalt Shingles	0.754	0.686	0.643	0.98	0.89	0.83
			FBC Equivalent	0.721	0.651	0.607	0.94	0.85	0.79
			Built-up roof without gravel	0.719	0.649	0.604	0.93	0.84	0.78
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.804	0.739	0.698	1.04	0.96	0.91
			Asphalt Shingles	0.776	0.710	0.668	1.01	0.92	0.87
			FBC Equivalent	0.751	0.683	0.640	0.98	0.89	0.83
			Built-up roof without gravel	0.749	0.681	0.638	0.97	0.88	0.83
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.773	0.707	0.664	1.00	0.92	0.86
			Asphalt Shingles	0.740	0.671	0.627	0.96	0.87	0.81
			FBC Equivalent	0.707	0.636	0.591	0.92	0.83	0.77
			Built-up roof without gravel	0.705	0.634	0.588	0.92	0.82	0.76
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.773	0.707	0.664	1.00	0.92	0.86
			Asphalt Shingles	0.740	0.671	0.627	0.96	0.87	0.81
			FBC Equivalent	0.707	0.636	0.591	0.92	0.83	0.77
			Built-up roof without gravel	0.705	0.634	0.588	0.92	0.82	0.76

Base Case

Low-Rise (1-3)	Pre-2002	Reinforced Concrete

				Loss Costs			Relativities		
				Window Protection			Window Protection		
Roof Geometry	Roof Anchorage	Roof Deck Attch	RoofCover	None	Non-Engineered	Engineered	None	Non-Engineered	Engineered
Hip	Nails/Screws	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.814	0.749	0.709	1.06	0.97	0.92
			Asphalt Shingles	0.791	0.726	0.684	1.03	0.94	0.89
			FBC Equivalent	0.770	0.704	0.661	1.00	0.91	0.86
			Built-up roof without gravel	0.769	0.702	0.660	1.00	0.91	0.86
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.789	0.723	0.681	1.02	0.94	0.88
			Asphalt Shingles	0.762	0.694	0.652	0.99	0.90	0.85
			FBC Equivalent	0.735	0.666	0.622	0.95	0.86	0.81
			Built-up roof without gravel	0.733	0.664	0.620	0.95	0.86	0.81
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.789	0.723	0.681	1.02	0.94	0.88
			Asphalt Shingles	0.762	0.694	0.652	0.99	0.90	0.85
			FBC Equivalent	0.735	0.666	0.622	0.95	0.86	0.81
			Built-up roof without gravel	0.733	0.664	0.620	0.95	0.86	0.81
	Anchor bolts	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.778	0.711	0.669	1.01	0.92	0.87
			Asphalt Shingles	0.755	0.687	0.644	0.98	0.89	0.84
			FBC Equivalent	0.733	0.664	0.620	0.95	0.86	0.80
			Built-up roof without gravel	0.732	0.663	0.619	0.95	0.86	0.80
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.752	0.684	0.641	0.98	0.89	0.83
			Asphalt Shingles	0.724	0.654	0.610	0.94	0.85	0.79
			FBC Equivalent	0.697	0.625	0.579	0.90	0.81	0.75
			Built-up roof without gravel	0.695	0.623	0.577	0.90	0.81	0.75
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.752	0.684	0.641	0.98	0.89	0.83
			Asphalt Shingles	0.724	0.654	0.610	0.94	0.85	0.79
			FBC Equivalent	0.697	0.625	0.579	0.90	0.81	0.75
			Built-up roof without gravel	0.695	0.623	0.577	0.90	0.81	0.75
	Hurricane Ties	6d nails @ 6 spacing, 12 on center	Light Metal Panels	0.764	0.697	0.654	0.99	0.91	0.85
			Asphalt Shingles	0.741	0.672	0.628	0.96	0.87	0.82
			FBC Equivalent	0.719	0.649	0.605	0.93	0.84	0.78
			Built-up roof without gravel	0.718	0.648	0.603	0.93	0.84	0.78
		8d nails @ 6 spacing, 12 on center	Light Metal Panels	0.738	0.669	0.625	0.96	0.87	0.81
			Asphalt Shingles	0.710	0.639	0.594	0.92	0.83	0.77
			FBC Equivalent	0.682	0.610	0.563	0.89	0.79	0.73
			Built-up roof without gravel	0.680	0.608	0.561	0.88	0.79	0.73
		8d nails @ 6 spacing, 6 on center	Light Metal Panels	0.738	0.669	0.625	0.96	0.87	0.81
			Asphalt Shingles	0.710	0.639	0.594	0.92	0.83	0.77
			FBC Equivalent	0.682	0.610	0.563	0.89	0.79	0.73
			Built-up roof without gravel	0.680	0.608	0.561	0.88	0.79	0.73

		Loss Costs						Relativities to None					Rel. to pre-2002 Base Case
Construction Type Group	**Window Protection**	**1**	**2+3**	**4**	**5**	**6**	**Statewide**	**1**	**2+3**	**4**	**5**	**6**	**Statewide**
Light Metal	None	1.189	2.252	3.114	7.043	7.932	3.049	1.00	1.00	1.00	1.00	1.00	0.85
	Non-Engineered	1.189	2.217	2.788	6.056	7.932	2.801	1.00	0.98	0.90	0.86	1.00	0.78
	Engineered	1.189	2.217	2.788	6.056	7.932	2.801	1.00	0.98	0.90	0.86	1.00	0.78
Wood Frame	None	0.697	1.392	1.932	4.401	4.111	1.839	1.00	1.00	1.00	1.00	1.00	0.70
	Non-Engineered	0.697	1.358	1.624	3.324	4.111	1.581	1.00	0.98	0.84	0.76	1.00	0.60
	Engineered	0.697	1.358	1.624	3.324	4.111	1.581	1.00	0.98	0.84	0.76	1.00	0.60
Joisted Masonry	None	0.513	1.060	1.465	3.451	3.621	1.430	1.00	1.00	1.00	1.00	1.00	0.77
	Non-Engineered	0.513	1.040	1.292	2.829	3.621	1.283	1.00	0.98	0.88	0.82	1.00	0.69
	Engineered	0.513	1.040	1.292	2.829	3.621	1.283	1.00	0.98	0.88	0.82	1.00	0.69
Masonry	None	0.457	0.972	1.346	3.269	3.586	1.336	1.00	1.00	1.00	1.00	1.00	0.83
	Non-Engineered	0.457	0.955	1.191	2.747	3.586	1.209	1.00	0.98	0.88	0.84	1.00	0.75
	Engineered	0.457	0.955	1.191	2.747	3.586	1.209	1.00	0.98	0.88	0.84	1.00	0.75
Reinforced Masonry	None	0.262	0.543	0.752	1.806	1.935	0.743	1.00	1.00	1.00	1.00	1.00	0.82
	Non-Engineered	0.262	0.533	0.663	1.501	1.935	0.669	1.00	0.98	0.88	0.83	1.00	0.74
	Engineered	0.262	0.533	0.663	1.501	1.935	0.669	1.00	0.98	0.88	0.83	1.00	0.74
Reinforced Concrete	None	0.225	0.466	0.645	1.553	1.670	0.639	1.00	1.00	1.00	1.00	1.00	0.83
	Non-Engineered	0.225	0.457	0.569	1.294	1.670	0.576	1.00	0.98	0.88	0.83	1.00	0.75
	Engineered	0.225	0.457	0.569	1.294	1.670	0.576	1.00	0.98	0.88	0.83	1.00	0.75

			Loss Costs Window Protection			Relativities to Group Base Window Protection		
Construction Type Group	**Wall Siding**	**Roof Cover**	**None**	**Non-Engineered**	**Engineered**	**None**	**Non-Engineered**	**Engineered**
Joisted Masonry	Exterior insulation finishing system (EIFS)	Simple ply membrane	1.600	1.497	1.434	1.11	1.03	0.99
		Built-up roof with gravel	1.595	1.491	1.428	1.10	1.03	0.99
	Aluminum/vinyl siding	Simple ply membrane	1.529	1.419	1.350	1.06	0.98	0.93
		Built-up roof with gravel	1.524	1.413	1.344	1.05	0.98	0.93
	Veneer brick/masonry	Simple ply membrane	1.436	1.312	1.233	0.99	0.91	0.85
		Built-up roof with gravel	1.430	1.306	1.227	0.99	0.90	0.85
Reinforced Masonry	Exterior insulation finishing system (EIFS)	Simple ply membrane	0.843	0.786	0.751	1.09	1.01	0.97
		Built-up roof with gravel	0.840	0.783	0.748	1.08	1.01	0.96
	Aluminum/vinyl siding	Simple ply membrane	0.804	0.743	0.705	1.04	0.96	0.91
		Built-up roof with gravel	0.801	0.740	0.702	1.03	0.95	0.90
	Veneer brick/masonry	Simple ply membrane	0.753	0.684	0.641	0.97	0.88	0.83
		Built-up roof with gravel	0.749	0.681	0.637	0.97	0.88	0.82
Reinforced Concrete	Exterior insulation finishing system (EIFS)	Simple ply membrane	0.563	0.525	0.502	1.09	1.02	0.97
		Built-up roof with gravel	0.561	0.523	0.499	1.09	1.01	0.97
	Aluminum/vinyl siding	Simple ply membrane	0.537	0.496	0.470	1.04	0.96	0.91
		Built-up roof with gravel	0.535	0.494	0.468	1.04	0.96	0.91
	Veneer brick/masonry	Simple ply membrane	0.502	0.457	0.427	0.97	0.88	0.83
		Built-up roof with gravel	0.500	0.454	0.425	0.97	0.88	0.82
Steel	Exterior insulation finishing system (EIFS)	Simple ply membrane	0.552	0.515	0.491	1.09	1.02	0.97
		Built-up roof with gravel	0.550	0.512	0.489	1.09	1.01	0.97
	Aluminum/vinyl siding	Simple ply membrane	0.527	0.486	0.461	1.04	0.96	0.91
		Built-up roof with gravel	0.525	0.484	0.459	1.04	0.96	0.91
	Veneer brick/masonry	Simple ply membrane	0.493	0.448	0.419	0.97	0.88	0.83
		Built-up roof with gravel	0.491	0.446	0.417	0.97	0.88	0.82

				Loss Costs						Relativities to Group Base					Relativity to
Construction Type Group	**Wall Siding**	**Roof Cover**	**Window Protection**	**1**	**2+3**	**4**	**5**	**6**	**Statewide**	**1**	**2+3**	**4**	**5**	**6**	**Pre-2002 Statewide**
Joisted Masonry	Exterior insulation finishing (EIFS)	Single ply membrane	None	0.460	0.929	1.280	3.060	3.692	1.288	1.15	1.14	1.13	1.15	1.33	0.89
			Non-Engineered	0.460	0.919	1.163	2.710	3.692	1.200	1.15	1.12	1.03	1.02	1.33	0.83
			Engineered	0.460	0.919	1.163	2.710	3.692	1.200	1.15	1.12	1.03	1.02	1.33	0.83
		Built-up Roof with Gravel	None	0.460	0.929	1.280	3.060	3.692	1.288	1.15	1.14	1.13	1.15	1.33	0.89
			Non-Engineered	0.460	0.919	1.163	2.710	3.692	1.200	1.15	1.12	1.03	1.02	1.33	0.83
			Engineered	0.460	0.919	1.163	2.710	3.692	1.200	1.15	1.12	1.03	1.02	1.33	0.83
	Aluminum/vinyl siding	Single ply membrane	None	0.432	0.877	1.210	2.885	3.281	1.205	1.08	1.07	1.07	1.08	1.18	0.83
			Non-Engineered	0.432	0.865	1.084	2.473	3.281	1.104	1.08	1.06	0.96	0.93	1.18	0.76
			Engineered	0.432	0.865	1.084	2.473	3.281	1.104	1.08	1.06	0.96	0.93	1.18	0.76
		Built-up Roof with Gravel	None	0.432	0.877	1.210	2.885	3.281	1.205	1.08	1.07	1.07	1.08	1.18	0.83
			Non-Engineered	0.432	0.865	1.084	2.473	3.281	1.104	1.08	1.06	0.96	0.93	1.18	0.76
			Engineered	0.432	0.865	1.084	2.473	3.281	1.104	1.08	1.06	0.96	0.93	1.18	0.76
	Veneer brick/masonry	Single ply membrane	None	0.395	0.809	1.120	2.632	2.652	1.088	0.99	0.99	0.99	0.99	0.95	0.75
			Non-Engineered	0.395	0.793	0.978	2.111	2.652	0.965	0.99	0.97	0.87	0.79	0.95	0.67
			Engineered	0.395	0.793	0.978	2.111	2.652	0.965	0.99	0.97	0.87	0.79	0.95	0.67
		Built-up Roof with Gravel	None	0.395	0.809	1.120	2.632	2.652	1.088	0.99	0.99	0.99	0.99	0.95	0.75
			Non-Engineered	0.395	0.793	0.978	2.111	2.652	0.965	0.99	0.97	0.87	0.79	0.95	0.67
			Engineered	0.395	0.793	0.978	2.111	2.652	0.965	0.99	0.97	0.87	0.79	0.95	0.67
Reinforced Masonry	Exterior insulation finishing (EIFS)	Single ply membrane	None	0.253	0.519	0.717	1.732	2.113	0.725	1.13	1.11	1.11	1.11	1.27	0.93
			Non-Engineered	0.253	0.513	0.650	1.544	2.113	0.676	1.13	1.10	1.01	0.99	1.27	0.87
			Engineered	0.253	0.513	0.650	1.544	2.113	0.676	1.13	1.10	1.01	0.99	1.27	0.87
		Built-up Roof with Gravel	None	0.253	0.519	0.717	1.732	2.113	0.725	1.13	1.11	1.11	1.11	1.27	0.93
			Non-Engineered	0.253	0.513	0.650	1.544	2.113	0.676	1.13	1.10	1.01	0.99	1.27	0.87
			Engineered	0.253	0.513	0.650	1.544	2.113	0.676	1.13	1.10	1.01	0.99	1.27	0.87
	Aluminum/vinyl siding	Single ply membrane	None	0.237	0.489	0.677	1.637	1.880	0.678	1.06	1.05	1.05	1.05	1.13	0.87
			Non-Engineered	0.237	0.482	0.605	1.412	1.880	0.622	1.06	1.04	0.94	0.91	1.13	0.80
			Engineered	0.237	0.482	0.605	1.412	1.880	0.622	1.06	1.04	0.94	0.91	1.13	0.80
		Built-up Roof with Gravel	None	0.237	0.489	0.677	1.637	1.880	0.678	1.06	1.05	1.05	1.05	1.13	0.87
			Non-Engineered	0.237	0.482	0.605	1.412	1.880	0.622	1.06	1.04	0.94	0.91	1.13	0.80
			Engineered	0.237	0.482	0.605	1.412	1.880	0.622	1.06	1.04	0.94	0.91	1.13	0.80
	Veneer brick/masonry	Single ply membrane	None	0.217	0.451	0.626	1.498	1.524	0.612	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.217	0.441	0.546	1.204	1.524	0.543	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.217	0.441	0.546	1.204	1.524	0.543	0.96	0.95	0.84	0.78	0.92	0.70
		Built-up Roof with Gravel	None	0.217	0.451	0.626	1.498	1.524	0.612	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.217	0.441	0.546	1.204	1.524	0.543	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.217	0.441	0.546	1.204	1.524	0.543	0.96	0.95	0.84	0.78	0.92	0.70

				Loss Costs						Relativities to Group Base					Relativity to
Construction Type Group	**Wall Siding**	**Roof Cover**	**Window Protection**	**1**	**2+3**	**4**	**5**	**6**	**Statewide**	**1**	**2+3**	**4**	**5**	**6**	**Pre-2002 Statewide**
Reinforced Concrete	Exterior insulation finishing (EIFS)	Single ply membrane	None	0.169	0.346	0.479	1.162	1.421	0.485	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.169	0.342	0.435	1.037	1.421	0.453	1.13	1.10	1.01	0.99	1.27	0.88
			Engineered	0.169	0.342	0.435	1.037	1.421	0.453	1.13	1.10	1.01	0.99	1.27	0.88
		Built-up Roof with Gravel	None	0.169	0.346	0.479	1.162	1.421	0.485	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.169	0.342	0.435	1.037	1.421	0.453	1.13	1.10	1.01	0.99	1.27	0.88
			Engineered	0.169	0.342	0.435	1.037	1.421	0.453	1.13	1.10	1.01	0.99	1.27	0.88
	Aluminum/vinyl siding	Single ply membrane	None	0.158	0.327	0.452	1.099	1.265	0.454	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.158	0.322	0.404	0.949	1.265	0.417	1.06	1.04	0.94	0.91	1.13	0.81
			Engineered	0.158	0.322	0.404	0.949	1.265	0.417	1.06	1.04	0.94	0.91	1.13	0.81
		Built-up Roof with Gravel	None	0.158	0.327	0.452	1.099	1.265	0.454	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.158	0.322	0.404	0.949	1.265	0.417	1.06	1.04	0.94	0.91	1.13	0.81
			Engineered	0.158	0.322	0.404	0.949	1.265	0.417	1.06	1.04	0.94	0.91	1.13	0.81
	Veneer brick/masonry	Single ply membrane	None	0.144	0.301	0.418	1.006	1.027	0.410	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.144	0.294	0.364	0.811	1.027	0.364	0.96	0.95	0.84	0.78	0.92	0.71
			Engineered	0.144	0.294	0.364	0.811	1.027	0.364	0.96	0.95	0.84	0.78	0.92	0.71
		Built-up Roof with Gravel	None	0.144	0.301	0.418	1.006	1.027	0.410	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.144	0.294	0.364	0.811	1.027	0.364	0.96	0.95	0.84	0.78	0.92	0.71
			Engineered	0.144	0.294	0.364	0.811	1.027	0.364	0.96	0.95	0.84	0.78	0.92	0.71
Steel	Exterior insulation finishing (EIFS)	Single ply membrane	None	0.163	0.339	0.469	1.146	1.402	0.475	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.163	0.335	0.425	1.022	1.402	0.443	1.13	1.10	1.01	0.99	1.27	0.88
			Engineered	0.163	0.335	0.425	1.022	1.402	0.443	1.13	1.10	1.01	0.99	1.27	0.88
		Built-up Roof with Gravel	None	0.163	0.339	0.469	1.146	1.402	0.475	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.163	0.335	0.425	1.022	1.402	0.443	1.13	1.10	1.01	0.99	1.27	0.88
			Engineered	0.163	0.335	0.425	1.022	1.402	0.443	1.13	1.10	1.01	0.99	1.27	0.88
	Aluminum/vinyl siding	Single ply membrane	None	0.152	0.320	0.443	1.084	1.249	0.445	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.152	0.315	0.396	0.936	1.249	0.408	1.06	1.04	0.94	0.91	1.13	0.81
			Engineered	0.152	0.315	0.396	0.936	1.249	0.408	1.06	1.04	0.94	0.91	1.13	0.81
		Built-up Roof with Gravel	None	0.152	0.320	0.443	1.084	1.249	0.445	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.152	0.315	0.396	0.936	1.249	0.408	1.06	1.04	0.94	0.91	1.13	0.81
			Engineered	0.152	0.315	0.396	0.936	1.249	0.408	1.06	1.04	0.94	0.91	1.13	0.81
	Veneer brick/masonry	Single ply membrane	None	0.139	0.295	0.409	0.992	1.013	0.402	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.139	0.288	0.356	0.800	1.013	0.357	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.139	0.288	0.356	0.800	1.013	0.357	0.96	0.95	0.84	0.78	0.92	0.70
		Built-up Roof with Gravel	None	0.139	0.295	0.409	0.992	1.013	0.402	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.139	0.288	0.356	0.800	1.013	0.357	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.139	0.288	0.356	0.800	1.013	0.357	0.96	0.95	0.84	0.78	0.92	0.70

			Loss Costs			Relativities to Group Base		
			Window Protection			Window Protection		
Construction	**Wall Siding**	**Roof Cover**	**None**	**Non-Engineered**	**Engineered**	**None**	**Non-Engineered**	**Engineered**
Reinforced Concrete	Exterior insulation finishing system (EIFS)	Simple ply membrane	0.423	0.394	0.377	1.09	1.02	0.97
		Built-up roof with gravel	0.422	0.393	0.375	1.09	1.01	0.97
	Aluminum/vinyl siding	Simple ply membrane	0.404	0.373	0.353	1.04	0.96	0.91
		Built-up roof with gravel	0.402	0.371	0.352	1.04	0.96	0.91
	Veneer brick/masonry	Simple ply membrane	0.378	0.343	0.321	0.97	0.88	0.83
		Built-up roof with gravel	0.376	0.341	0.319	0.97	0.88	0.82
Steel	Exterior insulation finishing system (EIFS)	Simple ply membrane	0.415	0.387	0.369	1.09	1.02	0.97
		Built-up roof with gravel	0.414	0.385	0.368	1.09	1.01	0.97
	Aluminum/vinyl siding	Simple ply membrane	0.396	0.365	0.346	1.04	0.96	0.91
		Built-up roof with gravel	0.394	0.364	0.345	1.04	0.96	0.91
	Veneer brick/masonry	Simple ply membrane	0.370	0.336	0.315	0.97	0.88	0.83
		Built-up roof with gravel	0.369	0.335	0.313	0.97	0.88	0.82

				Loss Costs						Relativities to Group Base					Relativity to
Construction Type Group	**Wall Siding**	**Roof Cover**	**Window Protection**	**1**	**2+3**	**4**	**5**	**6**	**Statewide**	**1**	**2+3**	**4**	**5**	**6**	**pre-2002 Statewide**
Reinforced Concrete	Exterior insulation finishing (EIFS)	Single ply membrane	None	0.126	0.260	0.360	0.874	1.069	0.364	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.126	0.257	0.326	0.780	1.069	0.340	1.13	1.10	1.01	0.99	1.27	0.88
			Engineered	0.126	0.257	0.326	0.780	1.069	0.340	1.13	1.10	1.01	0.99	1.27	0.88
		Built-up Roof with Gravel	None	0.126	0.260	0.360	0.874	1.069	0.364	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.126	0.257	0.326	0.780	1.069	0.340	1.13	1.10	1.01	0.99	1.27	0.88
			Engineered	0.126	0.257	0.326	0.780	1.069	0.340	1.13	1.10	1.01	0.99	1.27	0.88
	Aluminum/vinyl siding	Single ply membrane	None	0.118	0.245	0.340	0.827	0.952	0.341	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.118	0.241	0.303	0.714	0.952	0.313	1.06	1.04	0.94	0.91	1.13	0.81
			Engineered	0.118	0.241	0.303	0.714	0.952	0.313	1.06	1.04	0.94	0.91	1.13	0.81
		Built-up Roof with Gravel	None	0.118	0.245	0.340	0.827	0.952	0.341	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.118	0.241	0.303	0.714	0.952	0.313	1.06	1.04	0.94	0.91	1.13	0.81
			Engineered	0.118	0.241	0.303	0.714	0.952	0.313	1.06	1.04	0.94	0.91	1.13	0.81
	Veneer brick/masonry	Single ply membrane	None	0.108	0.225	0.314	0.757	0.772	0.308	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.108	0.221	0.273	0.610	0.772	0.273	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.108	0.221	0.273	0.610	0.772	0.273	0.96	0.95	0.84	0.78	0.92	0.70
		Built-up Roof with Gravel	None	0.108	0.225	0.314	0.757	0.772	0.308	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.108	0.221	0.273	0.610	0.772	0.273	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.108	0.221	0.273	0.610	0.772	0.273	0.96	0.95	0.84	0.78	0.92	0.70
Steel	Exterior insulation finishing (EIFS)	Single ply membrane	None	0.121	0.254	0.352	0.862	1.055	0.357	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.121	0.251	0.319	0.769	1.055	0.333	1.13	1.10	1.01	0.99	1.27	0.87
			Engineered	0.121	0.251	0.319	0.769	1.055	0.333	1.13	1.10	1.01	0.99	1.27	0.87
		Built-up Roof with Gravel	None	0.121	0.254	0.352	0.862	1.055	0.357	1.13	1.11	1.11	1.11	1.27	0.94
			Non-Engineered	0.121	0.251	0.319	0.769	1.055	0.333	1.13	1.10	1.01	0.99	1.27	0.87
			Engineered	0.121	0.251	0.319	0.769	1.055	0.333	1.13	1.10	1.01	0.99	1.27	0.87
	Aluminum/vinyl siding	Single ply membrane	None	0.114	0.240	0.332	0.816	0.939	0.334	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.114	0.236	0.297	0.704	0.939	0.306	1.06	1.04	0.94	0.91	1.13	0.80
			Engineered	0.114	0.236	0.297	0.704	0.939	0.306	1.06	1.04	0.94	0.91	1.13	0.80
		Built-up Roof with Gravel	None	0.114	0.240	0.332	0.816	0.939	0.334	1.06	1.05	1.05	1.05	1.13	0.88
			Non-Engineered	0.114	0.236	0.297	0.704	0.939	0.306	1.06	1.04	0.94	0.91	1.13	0.80
			Engineered	0.114	0.236	0.297	0.704	0.939	0.306	1.06	1.04	0.94	0.91	1.13	0.80
	Veneer brick/masonry	Single ply membrane	None	0.104	0.221	0.307	0.747	0.761	0.302	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.104	0.216	0.267	0.601	0.761	0.267	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.104	0.216	0.267	0.601	0.761	0.267	0.96	0.95	0.84	0.78	0.92	0.70
		Built-up Roof with Gravel	None	0.104	0.221	0.307	0.747	0.761	0.302	0.96	0.97	0.97	0.96	0.92	0.79
			Non-Engineered	0.104	0.216	0.267	0.601	0.761	0.267	0.96	0.95	0.84	0.78	0.92	0.70
			Engineered	0.104	0.216	0.267	0.601	0.761	0.267	0.96	0.95	0.84	0.78	0.92	0.70