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ABC Warehouse III A Maintenance Failure

The ABC Warehouse Company had been in their new offices and warehouse for over a year and they still found it exhilarating in such a comfortable, efficient, and attractive facility. They appreciated the fruits of competent architectural and engineering design and skillful construction. They were justly proud of their brand-new premises and were gradually getting used to taking care of it. Hyde Construction had been diligent in correcting the few minor defects that had surfaced during the first year and now the contractual warranty period had expired.

Allen Brady, ABC's president, had assigned Carl Daly, his thorough and hardworking warehouse manager to be in charge of property maintenance. Carl had hired a landscape gardener whose capable crew attended weekly and kept the planted areas looking beautiful and well groomed. Carl also had a list of reliable service companies specializing in industrial plant maintenance that he'd call upon the few times he would need an electrical, plumbing, or other technical repair. He had signed an annual air conditioning maintenance contract that provided for regular monthly inspection and filter service as well as emergency calls. In addition, a couple of his warehouse employees were handy for doing miscellaneous repairs and upkeep such as replacing light bulbs and fluorescent tubes and for performing minor painting jobs. He purchased a sturdy metal toolbox with an assortment of small tools like screwdrivers, wrenches, pliers, and a good hammer. He also bought a solid 18-foot aluminum ladder to facilitate light bulb replacements and other high repairs. He felt secure that he had all bases covered and that his ever-demanding boss, Mr Brady, could not criticize him for not taking proper care of the new building and grounds.

Every 5 or 6 weeks Carl would have one of his men go up on the roof to gather and remove any debris that would have been blown up there by errant wind currents, carried by industrious birds, or thrown by irresponsible passers-by. Al Barker, one of Carl's warehouse workers, was always surprised at the diversity of stuff that he would find on the roof. He regularly found pieces of newspapers, cigarette and candy wrappers, bits of cardboard, leaves and twigs of shrubs and trees, string, plastic grocery bags, and fast food wrappers. Al once found a tennis ball and, another time, a Frisbee. Usually the debris would accumulate next to the parapet walls, on the flow lines, and at the drains where it would have been carried by rain and wind. After collecting all the debris in a plastic bag, he would individually check all of the roof drains to make sure they were clean and clear. Al then brought the bag of debris with him, descended through the roof hatch, relocked it, and disposed of the trash. Afterwards, he always reported back to Carl for his next assignment.

On Friday of a dry sunny week in early summer, Carl instructed Al Barker to go up on the roof to remove the debris and check the drains. After collecting the usual windblown and thrown objects, Al started in on the roof drains. In order to clean out the accumulation of silt from one of the 4-inch diameter roof drains, he had to remove the cast iron high dome strainer. This involved removing four wing nuts which he carefully placed on the roof next to the open drain. He was kneeling on the roofing gravel and when he shifted to find

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a more comfortable position, his knee accidentally brushed against the wing nuts. He instinctively grabbed at them but was not fast enough. He watched all four of them quickly disappear down the gaping open pipe. He uttered a suitable exclamation, gathered up the trash bag and dome strainer, and went back inside the building.

He immediately reported the problem to Carl and handed him the strainer. Carl said, "Nothing to worry about, Al. I'll get some more wing nuts this afternoon. They're only about a nickel each. You can reattach the strainer first thing tomorrow. But right now I want you to go help Nigel move those television cartons."

So Carl placed the cast iron strainer on top of a filing cabinet in his office and promptly forgot about the wing nuts. He had more pressing matters. He thought about getting the wing nuts 2 or 3 times during the next month but never did quite get around to it.

ABC's business was steadily increasing and Allen was sure the new facility was attracting customers they had never seen before. He had just that morning told Carl about a large shipment of Danish furniture that would be arriving around noon. They would have to offload it at their receiving dock, store it for about two weeks, and then ship it out gradually over 10 days to a local hotel that was undergoing a major refurbishment. The total value of the furniture was approximately \$600,000. Carl would have to clear out and consolidate about 5000 square feet of warehouse space to keep this shipment all together. It took most of the morning to clear the needed space and then they stopped for lunch.

After the warehouse crew had finished its lunch break, the Danish furniture shipment started arriving. It took them nearly 4 hours to get it all unloaded and neatly stacked in Sections 18 through 28 of Bay 12 of the warehouse. Shortly thereafter, at 4:30, they closed down the warehouse and secured it for the weekend.

Carl went around and made a careful final check to be sure all doors were securely locked, set the burglar alarm, and hurried home so he wouldn't be late for his weekly bowling session.

It turned out to be an unexpectedly windy night and upon arriving home from bowling he was concerned about his trees. With the wind gusting and whistling, he went to bed. After a busy day at the warehouse and a vigorous bowling session he quickly fell asleep. During the night the wind slackened and was replaced by a heavy and persistent rainfall.

Saturday morning it rained continuously. It rained steadily all afternoon and evening. On the 6 o'clock news, the weather forecaster said that over 2 inches of rain had already fallen and there would be considerably more before the storm moved on.

It was a busy graveyard shift at the master control console of Continental Security. Donna Evans, one of a two-person team, was kept busy monitoring the central control system to which most of the local industrial burglar alarms were connected. The winds and heavy rains had set off several false alarms but who can tell the difference from the real thing? All default signals must be taken seriously.

When the automatically dialed call came in from System Number 9327 she called up the identity information and standing instructions on the VDU screen. It was ABC Warehouse. The instructions were to first call the warehouse office on the chance that someone there had set off the alarm accidentally or there was an armed robbery in progress. That's not too likely, Donna thought, it's three in the morning. She dialed, waited, and got no answer. The second call was to the local police station. The police operator said all their available cars were out on traffic accidents and false burglar alarm calls. "We'll get there as soon as possible. I can't say when." So then Donna made her third call, to Allen Brady.

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Allen couldn't imagine who would be calling at this ridiculous hour. He turned on the bedside lamp, noted the time as 3:15 AM, and answered the phone. He could hear the noisy downpour of rain pelting down on his adjacent patio. Donna said, "Sorry to call so late, Mr. Brady, this is Continental Security. We've received a signal from your intrusion alarm system. I've already called the police. It may be a false alarm, as we've received a rash of them in the last few hours on account of the wind and rain."

"Okay, thanks for calling." Allen was apprehensive but somewhat relieved since it probably was only a false alarm. He then dialed Carl Daly's number. Finally, Carl answered. Allen commanded, "Carl, will you go to the warehouse? I just got a call from Continental Security that our alarm is signaling. They've called the police. I'll meet you there."

Carl, now alert, said, "Yes, sir, I'll get there as fast as I can."

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Allen lived closer than Carl so was first to arrive even though he had had to drive slowly on account of the heavy rain and flooding. As he pulled into the ABC parking area he was puzzled, as everything looked normal except for the alarm bell ringing and the flashing blue strobe lights near the top of the warehouse parapet. He carefully parked in the stall marked Mister Brady, got out, and locked the car. He dashed through the rain to the front entrance door of the office wing and was standing on the covered porch shaking off rain and wondering if he should enter and risk meeting an armed intruder.

Just then Carl arrived, parked at an untidy angle in the aisle near the entrance, and ran to the porch. They went in together, turned on lights, and went directly to the main electrical switchgear room where the burglar alarm control panel was located. They both knew the proper code number but Carl got there first and keyed in the number to turn off the bells, sirens, and flashing exterior lights. It then seemed unnaturally quiet. A quick check of the offices revealed nothing out of place. They stayed together and started for the warehouse door. It was then that they noticed a sparkling trickle of water seeping in at the doorsill. As Carl opened the warehouse door, backed-up water gushed into the office corridor. Carl then hit the lighting circuit contactor for the first two warehouse bays. It immediately flashed and half of the lights went out again. There was still enough light so they could see what had happened. The warehouse looked like a great shimmering lake. There was water all over the place. It went up the aisles in every direction. It was dammed up against and running out through the small crack under the loading dock doors. They could see that a large piece of the roofing and roof-framing members were dangling down into the warehouse. A broken 2-inch diameter main water pipe was disgoring spouting and spraying water. Lighting fixtures and conduits were drooping and crazily swaying as the water kept them moving.

"The roof collapse must have triggered the burglar alarm," reasoned Carl. After a second of shocked realization, his brain shifted back into high gear and he shouted, "We've gotta get the water turned off." He ran for a wrench to turn off the valve at the meter. Where the hell's the damn water meter, he was thinking...Oh, I remember, it's next to the loading ramp entrance. He opened one of the freight dock roll-up doors and dammed up water flooded out over the dock into the truck well. He made a dash for the meter and found the valve. He fumbled, skinned his knuckles, but finally got it turned off and stumbled back through the rain to the warehouse. He was wet to the skin. He found Allen standing in front of the Danish furniture shipment. Most of the cartons were soaking wet, soggy, and dripping. Allen looked overwhelmingly desperate, shocked, and devastated.

Carl, now thinking clearly, said, "We'd better call some of our people and get them down here so we can start mopping up this mess and save our customers' storage." So they made their calls. Gradually the crew arrived and by 4:15 a force of six had assembled and they spent the next several hours squeegeeing, mopping, sweeping, drying, and cleaning floors, moving cartons and crates, and trying to restore order.

Rain was still falling through the gaping hole in the roof. Added to this was rainwater running down the roof's flow lines seeking the missing drain. So Carl's crew erected plastic sheeting like a tent and channeled the intercepted water to a 55-gallon barrel that had to be bailed out with a bucket every 20 or 30 minutes. By 5 o'clock in the morning the rain had stopped and the storm seemed to be moving on. Carl and his men had not stopped to rest and still had a lot of mopping and drying left to do. They had no idea yet how much damage had been done to their customers' goods.

Shortly after the clean-up operation had been organized, Allen dialed George Hyde of Hyde Construction Company and roused him out of a sound sleep. George was not at all pleased to hear from anyone at 5 o'clock on a Sunday morning.

Allen quickly explained the situation and George promised to hurry over to see what could be done. So George called Ezra Field his valued job superintendent and asked him to be there too. George was naturally concerned and curious about what could possibly have caused this catastrophe so thought it best to call Ivor Judge, ABC's architect. We may need some ideas on how to repair the building and how to protect our interests. If we're not careful, there'll be a lot of finger pointing and unjust apportionment of blame.

George Hyde and Ivor Judge arrived at about the same time, Ezra shortly thereafter. Ivor couldn't help noticing that most of the cars in the lot were parked helter-skelter with no regard for the carefully planned and laid out parking arrangement. He shrugged and parked similarly.

It was around 5:30 and the fresh new day was well under way. When George, Ezra, and Ivor arrived inside they received a complete run-down and a tour of the disaster zone by Allen and Carl. George and Ivor were extremely apprehensive as to the cause of this very costly looking mishap. They were both furiously churning their minds for possible lapses in their design or construction operations, fearful that their own contributions might have been tested and found wanting.

With considerable trepidation and ill-foreboding, the contractor and the architect scaled the stationary steel roof ladder, Ivor leading, through the hatch that had to be unlocked, and out onto the roof. Ivor was carrying his flash camera and a note pad. Two side bays adjacent to a roof drain had collapsed. They could see the roof drain that had ridden down with the subsided section of roof framing. That section of the roof structure was hinged down about 6 feet. They could clearly see that the drain's dome strainer was missing and there appeared to be something plugging the drain.

To get a closer look they had to return to the warehouse floor and, using Carl's 18-foot ladder, Ivor climbed up through the hole formed by the sagging portion of the roof. He examined the drain. In it was a round waxed paper milk shake carton wedged tightly into the drain as neatly as a cork. It must have been blown up onto the roof, he thought, and been carried by the first flow of rain into the drain. This stoppage would only cause rainwater ponding to a depth of 2 or 3 inches, not enough weight to collapse the roof. Then the overflow scupper would come into play. Why didn't it take the overflow? He climbed up another rung to where he was better able to see the remnants of debris that had so effectively closed the overflow outlet--newspaper pages, leaves, a rubber ball, a wrecked kite, some small sheets of waterlogged padded packing material, some strips of carpet padding, all wedged into and over the 4-inch x 3-inch opening where it was carried by the rainwater flow. He carefully photographed these conditions and climbed back down to the warehouse floor. Then, while George was up the ladder, Ivor made extensive notes and sketches of all that he had seen, painstakingly inventorying the debris.

He conjectured that the weight of the accumulated water must have collapsed a glu-lam purlin and when it suddenly gave way and dropped, the water pipe was broken. The fractured roofing membrane simultaneously liberated several thousand gallons of ponded water which emptied into the warehouse. Electrical fixtures, conduits, ventilation ducting, and insulation had all come down with the roof.

Meanwhile, Ezra busied himself listing the types and quantities of lumber, other materials, and equipment that would have to be brought to the job Monday morning to start the rebuilding. He was also listing the various subcontractors that would have to be put on call.

A few minutes later, Allen, Carl, George, and Ivor were drinking hot coffee in Allen's office. Carl was utterly exhausted from all the physical labor he had performed, but he did not sit down, as he was so wet and grimy. He seemed to be extremely uncomfortable and somber. Allen was concerned and absorbed and appeared to be in a state of shock.

George, in his usual direct mode of expression, said, "Well, this is one that can't be hung on old George Hyde. We build 'em right. Solid as Gibraltar! Never known to fail!"

Allen stirred from his preoccupation with customer losses and possible insurance coverage and replied, incensed and indignant, "What do you mean they don't fail? It did fail! No doubt about that! Hyde really screwed up this time! If it's not your fault, then Ivor must have botched the design. All I know is, decent buildings don't fall apart like this!" His voice was rising and unsteady.

George kept his cool and sat there smugly waiting for Ivor to speak up. Carl, distraught, stood uneasily, eyes downcast, as he now fully realized what must have happened. He wished he could disappear.

Ivor started to explain the situation to Allen. He described the entire physical condition as he found it and all of his presumptions. He explained, "If the strainer was in place none of this would have happened." Then he added, "There's only one thing I don't understand. Why was the cast iron dome strainer missing?"

Ivor continued, "I specifically remember seeing the strainers on all of the roof drains on my last inspection of the building just before the warranty period expired. What happened to that high dome strainer?"

Carl Daly looked up. "I can explain. I know what happened. It was my fault." He then recounted how the strainer happened to be missing. He was embarrassed and miserable.

After a few moments of silence while the import of Carl's admission permeated everyone's mind, Ivor gently suggested, "Right now, let's concentrate our efforts on cleaning up, getting this repaired, and keeping the rain out. Hyde construction can remove all of the collapsed and damaged building elements and reconstruct the whole thing in accordance with the original plans and specifications. As far as I know the original design is adequate. But, just to make sure, I'll have our structural engineering consultant, Myles Nolan, check it anyway. Also, we'll need a new building permit, so I'll get right on that, too. Reconstruction drawings and specifications will have to be prepared."

Allen started to consider his position. If this fiasco was caused by my own employees then ABC might get stuck with the cost of rebuilding the building. And what about the warehouse contents? We have over 3 million dollars worth of customers' goods including all that Danish furniture! I'll be ruined! All caused by that damn nitwit, Carl.

Well, nothing can change that now. It's done. We'll have to accept it and learn to live with it. Looks like he's really taking it hard. He probably thinks I'll fire his stupid ass. That's what I oughtta do. Damn him! Well, he's too loyal, conscientious, and diligent to let him go. He'll work even harder after this. I'll let him suffer first, though.

Allen was discouraged and beat. He turned to Ivor, "What do we do now? What'll it cost? Do you think my insurance will cover this? What'll our customers say? Our competitors'll have a field day."

Ivor, thoughtfully, "You've raised some serious questions here, Allen, that I can't answer. I'd suggest that you call your lawyer, Phil Quinn. Right now. See if he can come right over here. I'm sure he isn't very busy at 6 o'clock on a Sunday morning." So Allen called Phil, briefly described the situation, and Phil readily agreed to come right over.

While they waited for Phil, they went out into the warehouse to take another look at the ruins and the industrious mopping up operation that was still in full swing. Carl quietly rejoined the warehouse crew and pitched in again on the physical labor. He still looked distressed and dispirited.

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Phil Quinn, with the firm of Quinn & Quinn, had been handling Allen's legal problems since inception of ABC Warehouse nearly 20 years ago. He made good time on the deserted streets and smartly pulled in to ABC's now chaotic parking lot. By now, almost 7 o'clock, the sky was clear and developing into a beautiful sunny day.

Casually dressed, Phil strode briskly through the office and into the warehouse where he was stunned by the discouraging scene of building destruction and flood damage. Allen told him he should have seen it a couple of hours earlier when it looked even worse.

Allen led the way back to his office followed by Phil, Ivor, and George. Carl saw them leave but didn't attempt to join them. He went back to squeegeeing. Ezra was still organizing the reconstruction.

Back in his office, Allen invited Phil to sit in his tall-backed black leather swivel-chair behind his broad oak desk, a generous gesture he considered to be the ultimate honor. Allen then asked Ivor to recount to Phil the physical circumstances, his previously stated conjectures, and Carl's incredible admission.

After Ivor's concise elucidation, Allen turned to Phil, "What'll we do now? How'll our insurance carrier react to all this? Will we lose our coverage? What'll we do about our customers' damage? What if some of them are unreasonable? What'll this cost us?" His mind was overflowing with these and similar questions. He was deeply concerned.

Phil and Ivor were both taking copious notes. George Hyde now considered himself fortunate indeed to be merely an innocent bystander, as he clearly shared none of the blame for this disaster. Furthermore, he could look forward to a profitable cost plus contract starting first thing tomorrow morning. He could use a nice little fill-in job right about now. He just sat and made himself comfortable and available to answer questions. Phil, finishing his notes, and after some thought, replied, "Well, Allen, first, continue your clean-up activities and do your best to limit any further damage to your customers' stored property.

"Secondly, authorize your architects, Judge & King, and Hyde Construction to proceed immediately with reconstruction of the building and the restoration of weatherproofing and security.

"Thirdly, we must notify your insurance brokers and all of your storage customers of the situation.

"Right now, I want you to get me all of your insurance policies and customer storage contracts. I'll take them with me today. After I've reviewed the policies and contracts and evaluated them we'll decide how to proceed from there. I'll call you early tomorrow afternoon."

Allen was relieved that Phil was now firmly in charge and felt confident that all would be promptly resolved in the best possible way.

George and Ivor rose and walked out together. They each had an indefinable lightness in their strides and a profound sense of freedom and relief.

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Moral: Construction defects are not always the fault of contractors and architects. Sometimes owners' imperfect maintenance programs cause them.

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