IUPUI Water Damage Restoration Guideline

Purpose
The IUPUI Water Damage Restoration guideline was developed to insure that all water intrusions are handled in a professional manner which includes the latest information / procedures available. Every effort will be made to insure the health and safety of all IUPUI faculty, students, staff and visitors to the campus.

Goal
Guidelines, procedures and standards have been established not only to insure the safety of everyone on campus but also to include every means available to promote the preservation, replacement and/or repair of University property according to standards / recommendations contained in the IICRC S500 Standard and Reference Guide for Professional Water Damage Restoration, Institute of Inspection Cleaning and Restoration Certification.

Definitions
Certain terms and definitions associated with water damage restoration exist. The following are definitions of terms used.

Category 1 Water - Water originating from a source that does not pose substantial harm to humans. Category 1 water is also referred to as “clean water.”

Examples of clean water sources may include, but are not necessarily limited to the following:
- Broken domestic water supply lines;
- Tub or sink overflows with no contaminants;
- Appliance malfunctions involving domestic water supply lines;
- Melting ice or snow;
- Falling rainwater; and
- Broken toilet tanks and toilet bowls that do not contain contaminants or additives.

Clean water that has contact with structural surfaces and content materials may deteriorate in cleanliness as it dissolves or mixes with soils and other contaminants, and as time elapses.

Category 2 Water - Water containing a significant degree of chemical, biological and/or physical contamination and having the potential to cause discomfort or sickness if consumed by or exposed to humans. Category 2 water is also referred to as “gray water.” Gray water carries microorganisms and nutrients for microorganisms.

Examples of gray water sources may include, but are not necessarily limited to the following:
- Discharge from dishwashers or washing machines;
- Overflows from toilet bowls with some urine (no feces);
- Sump pump failures;
- Seepage due to hydrostatic pressure;
- Chilled and condensate water; and
- Fire Protection Sprinkler Water.

Gray water may contain chemicals, biocontaminants (fungus, bacterial, viral algae) and other forms of contamination including physical hazards.

Time and temperature aggravate category 2 water contamination levels significantly. Gray water in flooded structures that remains untreated for longer than 48 hours may change to category 3 - black water.
**Category 3 Water** - Grossly unsanitary water containing pathogenic agents, arising from sewage or other contaminated water sources and having the likelihood of causing discomfort or sickness if consumed or exposed to humans. Black water includes sewage and other contaminated water sources entering or affecting the indoor environment. Category 2 water that is not removed promptly from the structure may be reclassified as category 3 water. Toilet back flows that originated beyond the toilet trap are considered black water contamination, regardless of visible content or color.

Category 3 water also includes, but is not necessarily limited to all forms of flooding from:

- Ground surface water; and
- Rising water from rivers or streams.

Such water sources carry silt and organic matter into structures and create black water conditions.

**Excess Water Removal** - Excess water removal is essential as the beginning point of restoration procedures. Removal of excess water may be achieved by physical means such as mopping or soaking up excess moisture from hard surfaces or furnishings. However, water removal usually involves the use of more sophisticated techniques and equipment such as pumps, or specially designed commercial wet vacuuming equipment.

**Evaporation** - Once excess water is removed, remaining water must be changed from a liquid to a vapor by promoting evaporation. Normally, this is accomplished efficiently with specialized air-moving equipment.

**Dehumidification** - Once moisture is evaporated from structural materials and contents into the air, the moisture must be removed from the air through dehumidification, or it must be externally exhausted. Failure to dehumidify may result in substantial secondary damage and present a significant health hazard.

**Temperature Control** - Both evaporation and dehumidification are greatly enhanced by controlling the temperature in a confined environment. Additionally, microorganisms' growth is temperature related. Thus, temperature modification and control is an important basic principle for safe, effective drying.

**Monitoring** - The damaged structure must be monitored starting with the initial assessment and evaluation, and continuing throughout the restoration process. Monitoring procedures may include, but are not limited to the following:

- Temperature and humidity readings;
- Updating drying progress status; and
- Checking the moisture content of structural wood and other materials with a moisture meter.

When applicable, monitoring also must include checking equipment operation, work progress and indoor environment quality. Drying Standards have been developed and are presented as an appendix.

**Inspection** - Following the removal of excess water and installation of drying and dehumidification equipment, a detailed inspection must be conducted that considers the extent of water migration, the types and quantities of affected materials and the degree of apparent damage. The information obtained may be used to analyze the extent of damage and to determine the job scope. Professional testing equipment and the principals of psychrometry must be used to formulate a plan to dry and restore, or replace both structural materials and contents. A comprehensive inspection may include, but is not necessarily limited to, the following:

- Identifying and evaluating health and safety hazards;
- Determining the source of water;
- Determining the need to protect floor covering materials and contents;
- Determining the extent of moisture intrusion;
- Determining the job scope;
- Evaluating flooring materials;
- Evaluating inventories and/or contents items;
- Evaluating the HVAC system if affected;
- Assessing other structural materials (walls, ceilings, etc.);
- Documenting preexisting conditions not related to the current loss (wear, urine contamination, delamination, etc.); and
- Establishing drying goals.
**Floor covering evaluation** - It is recommended that a determination be made as to whether floor-covering materials (e.g. carpet, cushion, vinyl, wood, laminates) are salvageable. Considerations may include, but are not necessarily limited to the following:

- Construction integrity; and
- Porosity and potential health effects from contaminants.

Disposition of floor coverings and the ability to salvage them will be determined according to the appended Drying Standards.

**Structural Materials** - Throughout the restoration process, it is highly recommended that effort is directed toward anticipating secondary damage and attending to other structural components that may require drying, or demolition and replacement. This is especially important if water remains in contact with building materials longer than 24 hours, such as water on flooring in contact with gypsum board. These components may include, but are not necessarily limited to the following:

- Ceilings
- Walls
- Built-in furnishings and fixtures
- Insulation
- Structural wood

**Occupant Evacuation** - For areas with extensive water damage, determine if occupants need to be evacuated from the damaged area, and, if so, estimate the duration of time. Factors used to make this determination may include, but are not necessarily limited to the following:

- Contamination;
- Obvious indications of high levels of microbiological or chemical contamination; and
- Presence of occupants who are immunocompromised or have mold allergies, asthma or other applicable medical conditions.

**Technician Training** - Technicians performing category 2 water (gray water) and category 3 water (black water) damage restoration must be trained in risks of exposure and procedures for safe cleanup of these materials.

**Personal Protection** - Persons working in or around Category 3 water during the initial stage of decontamination, cleaning and biocide application must be equipped with personal protective equipment (PPE) including but not necessarily limited to the following:

- Rubber gloves
- Eye protection
- Protective suit
- Rubber boots

An evaluation must be made to determine the necessity for respiratory protection. In the case of overhead hazards or contamination, hard hats must also be worn.
Criteria for determining when Building Materials are “Dry”

The underlying principles that guided the development of these standards were:

1. The ambient conditions must be stabilized and be able to be held at normal room conditions;
2. The building materials must be returned to their equilibrium moisture content to prevent the active growth of fungal spores; and
3. The building materials must be returned to their pre-loss moisture state. When these three criteria are met, a building can be considered dry.

Drying services shall be considered sufficient when the following three conditions have been achieved.

1. The interior ambient conditions are at or better than normal room conditions (50%RH @ 70°F);
2. The moisture in the building materials themselves will not support the active growth of mold and mildew; and
3. The building materials and contents will finish returning to equilibrium with normal room conditions by themselves without further damage to them.

This Standard was originally developed by Munters Corporation and amended for use at IUPUI. Campus Facility Services or the Department of Environmental Health and Safety will provide measurement of moisture in building materials.

**Hardwood Floors** - For the purposes of this Standard, drying services on a hardwood floor shall be considered sufficient when all four of the following conditions are met.

1. The moisture content (MC) of the wood is decreasing.
2. All affected wood is within 2.5% of its normal moisture content as determined by actual measurement in a control point elsewhere on the same floor.
3. The differential of MC in wood from the top ¼” to the bottom ¼” is no more than 1%.
4. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

**Drywall** - Drying services for drywall will be provided by IUPUI Building Services or an outside contractor. If drying procedures are not initiated within 24 hours of the initial water loss or dried within 72 hours, all wet drywall must be replaced. For the purposes of this Standard, drying services on drywall shall be considered sufficient when all four of the following conditions are met.

1. The moisture content of the drywall is decreasing.
2. All affected drywall is within 10% of its normal moisture content as determined by actual measurement in a control point elsewhere in the same building. (Example: Taking several readings in unaffected areas of drywall showed that the MC that should be expected in the building is 14%. Therefore, the maximum reading at the end of the job should be no more than 24%.)
3. The differential of MC in wood from the top ¼” to the bottom ¼” is no more than 1%.
4. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.
Concrete Block - For the purposes of this Standard, drying services on concrete block shall be considered sufficient when all four of the following conditions are met.

1. The moisture content of the concrete block is decreasing.

2. All affected concrete block is within 10% of its normal moisture content as determined by actual measurement in a control point elsewhere in the same building. (Example: Taking several readings in unaffected areas of concrete block showed that the MC that should be expected in the building is 10%. Therefore the maximum reading at the end of the job should be no more than 20%).

3. 95% of the affected concrete block area meets criteria 1 & 2.

4. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

Plaster - For the purposes of this Standard, drying services on plaster shall be considered sufficient when all four of the following conditions are met.

1. The moisture content of the plaster is decreasing.

2. All affected plaster is within 10% of its normal moisture content as determined by actual measurement in a control point elsewhere in the same building. (Example: Taking several readings in unaffected areas of plaster showed that the MC that should be expected in the building is 10%. Therefore the maximum reading at the end of the job should be no more than 20%).

3. 95% of the affected plaster area meets criteria 1 & 2.

4. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

Concrete - For the purposes of this Standard, drying services on concrete shall be considered sufficient when all four of the following conditions are met.

1. The moisture content of the concrete is decreasing.

2. All affected concrete is within 10% of its normal moisture content as determined by actual measurement in a control point elsewhere in the same building. (Example: Taking several readings in unaffected areas of concrete showed that the MC that should be expected in the building is 10%. Therefore the maximum reading at the end of the job should be no more than 20%).

3. 95% of the affected concrete area meets criteria 1 & 2.

4. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

Carpeting - For the purposes of this Standard, drying services on carpeting may be effective if the following conditions are met.

1. The carpet is not wet with Category 1 or 2 water for more than 48 hours.

2. The carpet is not wet with Category 3 (black) water for any amount of time.

3. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

4. If 1 and 2 are not met, the carpet must be removed and replaced. Carpeting shall be steam-cleaned and thoroughly dry prior to reoccupancy.
Insulation: For the purposes of this Standard, thermal insulation materials used in walls or ceilings cannot be adequately dried and reused. If insulation material is determined to be wet, it must be removed from the building. The area where it was installed must be thoroughly cleaned, disinfected and dried. New insulation may then be installed.
APPENDIX B – WATER RESPONSE PROCEDURE

Purpose
This document is designed to ensure the proper response procedure for CFS Personnel addressing water damage incidents.

Response and Communication Procedures
1. Customer reports leak to CFS via the trouble line at 278-1900 during normal working hours or after hours or the leak is discovered by CFS Personnel.

2. Building Services and Zone Maintenance shall insure that proper supervision is notified in both departments.

3. Building Services and Zone Maintenance will respond to location.

4. The Zone Maintenance Manager will determine the presence of additional hazards such as damaged/impacted asbestos containing materials, electrical hazards, or chemical/biological/radiological hazards.

5. If hazardous materials (chemical, biological, radiological) are stored or used in the area, the Zone Maintenance Manager shall contact the IUPUI Police Department at 274-7911 and ask that an IU Notify be sent to the Laboratory Emergencies Group.

6. If Asbestos Containing Materials are damaged or impacted, the Zone Maintenance Manager shall contact the EHS Asbestos Manager at 274-2005 during normal working hours or 274-7911 after hours.

7. The Zone Maintenance Manager in charge will determine whether CFS staff can effectively remove the water and dry the area or if an outside contractor should be employed for this service.
   - Contact an outside contractor if one of the following has occurred:
     - Water damage affects more than one floor or more than two rooms
     - Water is classified as category 3 water such as ground water, sewage, river water, or water contaminated with biological or chemical pollutants
     - Water damage occurs over the weekend or after hours

8. Preferred contractors for water loss cleanup are DialOne Magn-Dry (549-2786) and Steamatic (849-7500).

9. The Zone Maintenance Manager in charge shall contact all essential Departments.
   - Risk Management – Contact Steve Arthur at ……
   - EHS – After hours contact the IUPUI Police Department at 911. They will page the EHS on-call person. During working hours call 274-2005.
   - Department being affected by the water damage (School of Medicine, LARC, School of Dentistry….)

10. CFS takes appropriate protective measures to protect floor coverings from water that may be transferred to them from traffic in and out of the area.

11. Zone Maintenance isolates and stops leak.

12. CFS takes appropriate protective measures to dry furniture. The bottom of furniture is to be dried off and a wedge placed under the furniture with air movers directed toward the furniture to assist with drying.

13. Building Services will remove water from the damaged surfaces via the use of wet vacuums and floor dryers.

14. Zone Maintenance and/or contractor will install dehumidifiers and floor fans in the area after the majority of the water has been removed.

15. Reassess the water damage and determine whether IUPUI can effectively eliminate the water damage or if a contractor needs to be employed.

16. If drywall has become wet, remove baseboard and drill holes in the drywall every 24 inches. For areas with vinyl wall coverings, remove the wall covering up to a point that is dry and tack the wall covering away from the wall to allow for proper drying. If evidence of mold is found on the drywall or vinyl wall covering put wall covering back in place.
17. Zone Maintenance will check the operation of and insure that the majority of the water has been removed.

18. If building materials other than carpet have become wet, or if visible mold is observed, Zone Maintenance or Building Services will contact Environmental Health and Safety for further evaluation and moisture measurements.

19. Zone Maintenance and Building Services will perform any additional remediation/restoration that may be required.

20. Environmental Health and Safety will provide a final evaluation of the area to insure that it is safe for reoccupancy.

21. Zone Maintenance and Building Services will move furniture back into restored area and will dispose of the visqueen and cardboard used to protect the adjacent areas.