

DID YOU SEAL THAT BUILDING ENVELOPE?

Building Envelope Defect and Litigation



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Learning Objectives

- Utilizing a case study example demonstrate how a project timeline parallels a litigation timeline within a defect situation through a detailed case study.
- Learn strategies for defect prevention, discovery, and resolution.
- Identify risk management techniques for addressing and resolving disputes including analysis, defenses, and available resolution methods.
- Understand how to define, classify, assign responsibility for, and resolve defects.

The Case Study

University Dormitories
Design Coordination Defects

Claim “Components”

- ***Factual Entitlement***
 - Tell the Story
- ***Legal Entitlement***
 - Access to Claim per contract
 - Local Legal Provisions
- ***Damages Calculation***
 - Requested adjustment to time and/or money

Project Background

The project consisted of 2 new and 1 renovated undergraduate residence halls on a University Campus totaling 283,000sf on 2 sites with parking and provisions for 800 beds. The project delivery was CM at risk competitive bid of multiple bid packages. Construction began in 2005 and was completed in early 2007.

J.S. Held was retained by the University's legal counsel to assess the costs related to miscellaneous design related issues that arose on the project. These issues included an almost complete re-design of the entire Building Enclosure systems to remedy the architect's failure to coordinate proper materials and details.

This re-design in turn was a significant factor that led to schedule acceleration efforts, and related increased loss of labor productivity and overtime production costs, extended general conditions, and increased project management costs, as well as lost revenue for the University.



Owner Claims

- ***Entitlement Concepts***
 - Defective Work
 - Defective Design
 - Lack of Performance within time required
- ***Damages***
 - Liquidated Damages (Overall Project)
 - Consequential Damages (Specific issues)



Defect Types

Design

- Not specified or detailed properly

Installation

- Not constructed per industry standards or design requirements

Product/Material

- Material flaw during production, does not perform as intended

Maintenance

- Allowed to deteriorate/weather over time

Defect Causes

- Process (QA)
 - Lack of proper procedures set forth
- Personnel
 - Insufficient supervision, inexperienced workforce
- Performance (QC)
 - Design details are lacking
 - Compressed schedule
 - Breakdown / lack of communication
 - Inaccurate field measurements
 - Incompatibility of materials
 - Inadequate storage of materials

Failure Points Defect Responsibility

Designer is
responsible to...

- Fulfill Owner program requirements
- Meet Professional standards of care
- Comply with regulatory codes

Contractor

- Fulfill contract requirements
- Conform to designs and specifications
- Comply with regulatory codes

Owner/Occupant

- Maintenance → sustain installed materials
- Renovation → modifications to existing conditions

Factual Entitlement

Lack of Building Enclosure System
Design Coordination

(Basis for University's Claim)

Vapor Barrier on the Roof?

- Exposed concrete ceiling/Roof structure
- Wet roof insulation
- VAPOR BARRIER!!! (*or lack thereof*)

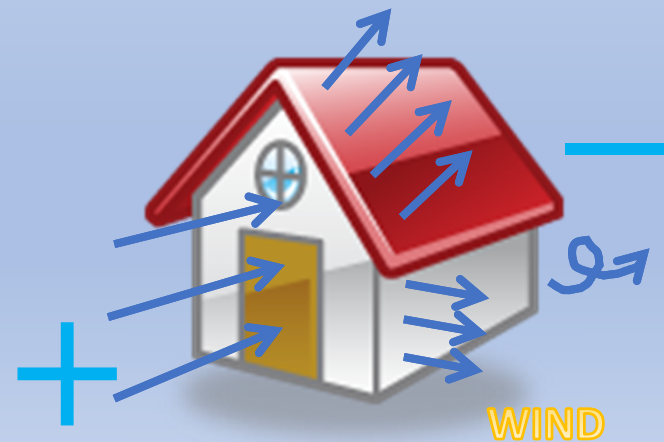
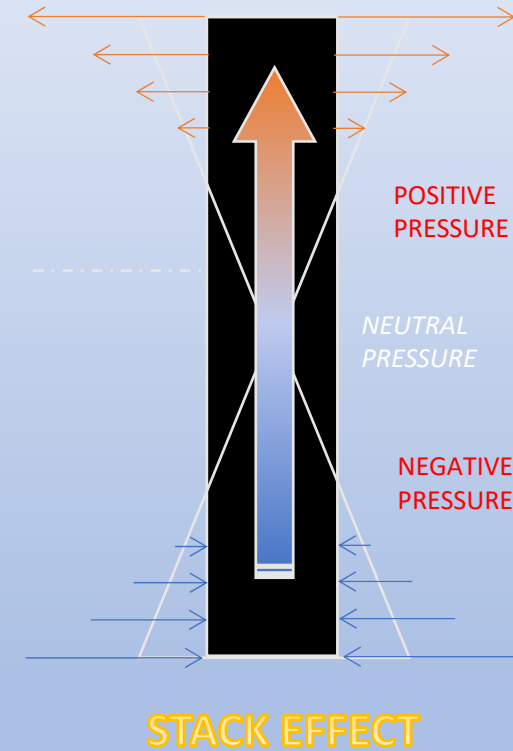
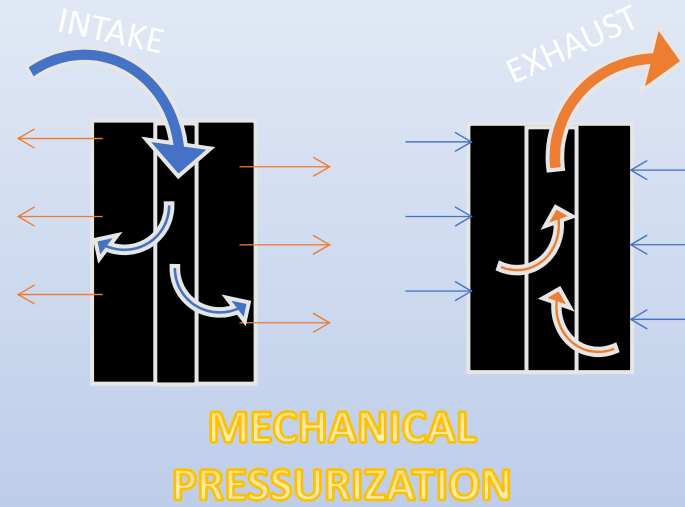


HVAC vs. The Envelope

- CMU masonry bearing structure with a brick veneer exterior
- PTAC units in each room

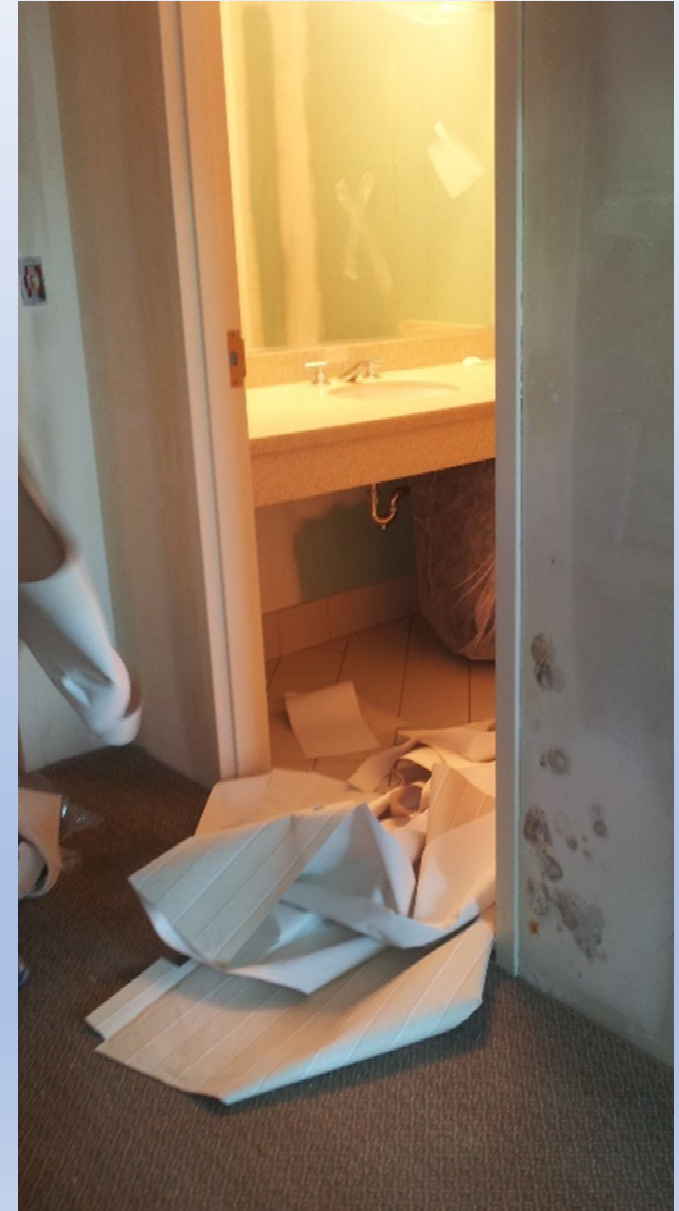


The Force is Strong with this one...



The Usual Suspects

- Continuous Exhaust
- Leaky Exterior Walls
- Vinyl Wall Covering
- Over-cooling



Windows = Penetrations

- Window Failure
- Improper Installation

Wood Sill + Water = Bad

*Just because you picked a
crappy window...*



Lick and Stick

- Dry stack veneer



*Oh, you mean you need to watch out
for freeze-thaw in the North?????*

Compatibility Failure

- 1800's construction
- New stucco



Construction or Design?

- Stucco Moisture Intrusion

Who's to blame?



Condensation

- Rising air
- Cold Weather



*Spray foam will cure
a lot of evils*



Legal Entitlement

The Construction Contract


Construction Contract

- ❑ Identifies essential relationship elements (Relationship Framework):
 - Communicate the Who, What, How, When, How much do I get paid, etc.
 - Describe scope of work
 - Describe obligations and duties
 - Describe rights and remedies

- ❑ Allocates Risk (Cost Risk Framework):
 - Risks belong with those parties who are best able to evaluate, control, bear the cost, and benefit from the assumption of risks.
 - Many risks and liabilities are best shared.
 - Every risk has an associated and unavoidable cost which must be assumed somewhere in the process.

RISK = \$

Essential Contract Terms

- 
- Scope of work ... “What” has to be done (some “how”)
 - Payment ... Compensation (how much it costs)
 - Site Conditions ... Where (some “how” and some “what”)
 - Time Management Provisions ... “When” (and how parties know)
 - Exculpatory Clauses ... I waived what?
 - Choice of Law & Venue ... When there’s a fight
 - Attorney Fee Provisions ... It will cost how much to fight?
 - Basic Contract Forms ... How all the above is communicated

Standard Form Contracts

- AIA Documents
- AGC Documents
- DBIA Documents
- EJCDC Documents
- FIDIC Documents

University's Legal Entitlement

Legal Basis for Claim

Legal Bases for University's Claims

- Architect Violated the Standard of Care for a Design Professional
- Architect Breached its Contract with University

Architect Contract

By contract, Architect agrees to:

- coordinate its activities to complete work in a timely fashion recognizing that University is scheduling occupancies of the dormitories based on an agreed project schedule. (Sec. 1.1.2.6.)
- perform its services “in accordance with the degree of professional skill and care required by applicable law and as expeditiously as is consistent with professional skill and care and the orderly progress of the Project.” (Sec. 1.2.3.2.)
- review all laws, codes, and regulations applicable to the Project and respond to requirements imposed by governmental authorities. (Sec. 1.2.3.6.)

University/Architect Contract (cont.)

Architect's design services include "normal structural, mechanical and electrical engineering services." (Sec. 2.4.1.).

- Construction documents "shall set forth in detail the requirements for construction of the Project . . . [and] include Drawings and Specifications that establish in detail the quality levels of materials and systems required for the Project." (Sec. 2.4.4.1.)
- All design and construction documents "per University standards", not just mere compliance with building code. (Att. B)

University/Architect Contract (cont.)

Architect is responsible for:

- Architect's and its consultants' negligent acts and omissions. (Sec. 1.2.3.2.)
- indemnifying University and CM for all losses arising from Architect's "negligence, errors, and/or omissions and pay damages, costs, and expenses including reasonable attorneys fees" (Sec. 1.3.6.10.) (emphasis added)

Architect/Consultant's Contract Services

Schematic Design Phase

“Assist Architect during the schematic design phase with major Building Enclosure requirements.”

Architect/Consultant's Contract Services

Design Development Phase

“Participate in design team meetings as necessary to coordinate the building enclosure system design.”

Prepare Typical Floor Plan drawings with “[s]ufficient detail to show moisture intrusion prevention concepts and to show that building enclosure system elements are coordinated with architectural elements.”

Architect/Consultant's Contract Services

Construction Document Phase

“Participate in design meetings (at periodic intervals) as necessary to coordinate the Building Enclosure and waterproofing systems design with the team.”

Architect/Consultant Contract

Additional Consultant Obligations

(from AIA C141)

- “All aspects of the Work designed by the Consultant shall be coordinated by the Consultant, and the Consultant shall also become familiar with the Work designed by the Architect and other consultants as necessary for the proper coordination of this Part of the Project.”
- “The Consultant’s services shall be performed in manner, sequence and timing so that they will be coordinated with those of the Architect and other consultants for the Project.”

University Damages

Increased Costs due to Design E&Os

Design Correction Type	INCREASED COST
Added Scope	
“In-Sequence”	
Material	10%
Labor	20%
“Out of Sequence”	
Material	15%
Labor	40%
No Functional Value Added	100%

**No Functional Value Added Example
CR 242: Building Enclosure Design Coordination**

CR - 242:

Grande Masonry LLC:	\$15,187
MF Construction Corporation:	\$4,009
CAPCO Steel Corporation:	\$22,093
H. Carr & Sons Inc:	\$23,100
Color Concepts Inc:	\$0
Delta Mechanical Contractors LLC:	\$486,710
Professional Mechanical Contractors:	\$17,639
Robert F Audet Inc :	\$0
Total Cost:	\$568,737

Material Cost

University Incurred cost:	\$96,430
Architect Allocated cost:	\$96,430

Labor Cost

University Incurred cost:	\$472,307
Architect Allocated cost:	\$472,307

Total cost allocated to Architect: \$568,737

No Functional Value Added Example

CR's 161,355,356,360: Added Flashing to Accommodate design Coordination

CR - 161

Material Cost:	\$22,296
Labor Cost:	\$47,090
Total Cost:	\$69,386

CR – 355

Material Cost:	\$31,702
Labor Cost:	\$44,869
Total Cost:	\$76,571

CR – 356

Material Cost:	\$36,610
Labor Cost:	\$54,914
Total Cost:	\$91,524

CR – 360

Material Cost:	\$48,327
Labor Cost:	\$74,907
Total Cost:	\$123,234

Material Cost

University Incurred cost:	\$138,935
Architect Allocated cost:	\$138,935

Labor Cost

University Incurred cost:	\$221,780
Architect Allocated cost:	\$221,780

Total cost allocated to Architect: \$360,715

Claims Management

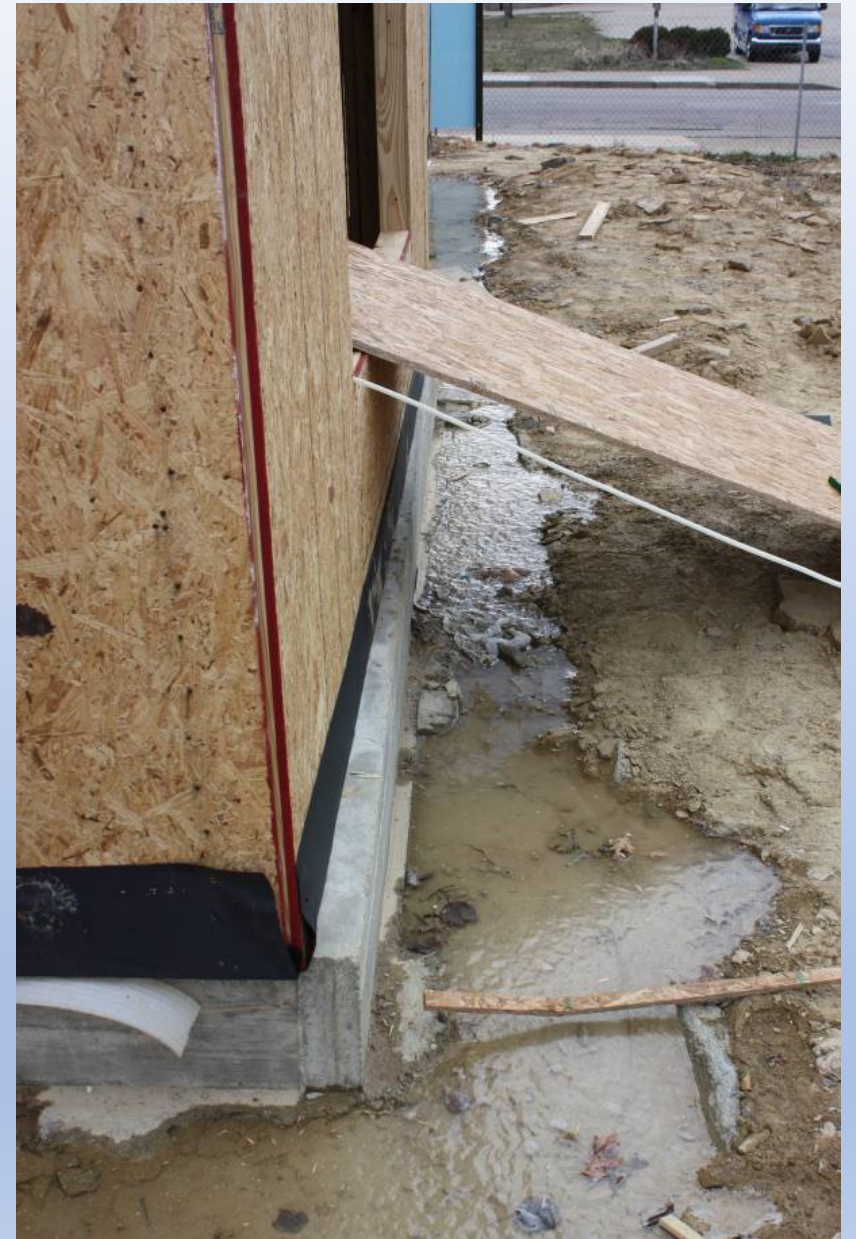
Claims Avoidance



DEFECT MANAGEMENT

Mistakes are a part of being human.
Appreciate your mistakes for what they are:
precious life lessons that can only be learned
the hard way.

Unless it's a fatal mistake, which, at least,
others can learn from.



Defect Prevention

Processes

- Lack of Procedures

Personnel

- Insufficient supervision
- Inexperienced workforce

Performance

- Lack of design details
- Compressed work schedule
- Lack of communication
- Inaccurate measurements

Material

- Incompatibility (joints, primers/paints)
- Inadequate storage
- Poor substrate (ex. epoxy terrazzo, wood flooring)
- Unapproved substitutions

Sequencing

- *Design*
 - Belt and Suspenders
 - Multi-layers (analogous to human skin)
 - No single source of failure (i.e. don't rely on sealant as your moisture barrier)
 - Flashings
- *Materials*
 - Layers
 - Each material serves a purpose (i.e. structural, aesthetic, functional)
 - Compatibility of materials (i.e. aluminum and P.T. wood, aluminum and mortar, metal to metal, etc.)
 - Flashings
- *Installation*
 - Be aware of the direction of moisture flow (i.e. lap materials in the appropriate direction)
 - Wall penetrations
 - Constructability
 - Flashings
- When does each wall component get installed?
- Who has responsibility for the complete system?

Integration

- *Transitions*
 - Parapet to roof
 - Roof to wall
 - Wall to slab
 - Slab to foundation
- *Penetrations*
 - Window in wall
 - Door in wall
 - Vent thru roof
 - Roof curb
- *Terminations*
 - End Dams
 - Sill Pans
 - Kick-out flashing

Defect Prevention

- Pre-construction
 - Well defined construction documents
 - Pre-qualification of field personnel
 - Pre-qualification of inspection personnel
- Construction
 - Detailed work procedures
 - Jobsite quality inspections
 - Investigation of existing conditions prior to start of work
 - Investigation of critical work procedures
 - Investigation to verify compliance at completion
- Post-Construction
 - A system to identify, correct, and prevent future defects

Defect Prevention - Architect

Document Review

- Details – Show it (Think of how they will build it)
- Specifications (Know what they say, Know what you want)

Construction Administration

- Have a site presence
- Visit the site unannounced

Manage Water and Moisture Infiltration

- Assume it's going to get in, Know how it's going to get out

Design for Construction Tolerances

- Know what the industry standards are for allowable variances on materials and installations

Moisture Management

- *Fundamental Rules of Moisture Management*
 - Moisture generally moves from areas of:
 - High temperature to low temperature
 - High moisture to low moisture (RH)
 - Positive air pressure to negative air pressure
 - Note: These driving forces do not always act in the same direction
- *Moisture Control Strategies*
 - Prevent moisture intrusion (barrier)
 - Limit moisture movement (retarder)
 - Prevent moisture accumulation (drainage/venting)

Claims Management

Proving (or Disproving) the Claim

Claim Process

- Find out what happened vs. what was supposed to happen (*Basic Facts - data collection*) THEN
- What made “it” happen (*Schedule analysis*) THEN
- The entity (if any) who had responsibility to “avoid” the happening from occurring (*Liability analysis – relevant contract clauses*) THEN
- Whether that effect resulted in any damages (*Damages analysis*) BUT
- Don’t forget about defenses and “exculpatory clauses”

Post- Construction Defects

Root Cause Analysis

Forensic Defect Evaluation

Remediation and Repair Recommendations

Scope of Work Preparation

Cost to Repair

Repair Oversight

Claims Management

Defending Against a Claim

Defenses to Claims

- *Notice and waiver*
- *Accord and Satisfaction (executed change order)*
 - Exculpatory and limiting clauses (“No damages for Delay”)
- *No Causation Shown*
- *NO Liability*
- *Interceding Factors Shown*

No Link or Nexus between Causal Factors Shown to be Responsibility of other Party and Damages of Claiming Party

Claims Management

Resolution

Dispute Resolution Steps

Litigation

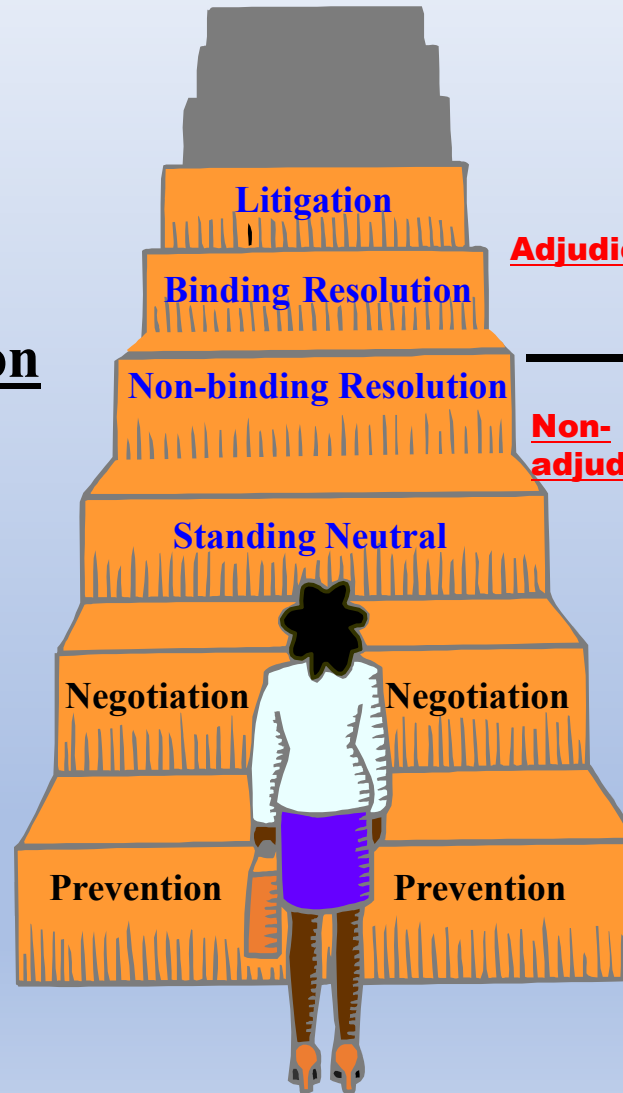
- * Judge/Jury/Special Master

Non-binding Resolution

- * Mediation
- * Mini-trial
- * Advisory Arbitration
- * Advisory Opinion

Negotiation

- * Direct Negotiation
- * Step Negotiation



Binding Resolution

- * Binding Arbitration
- * Private Judge

Standing Neutral

- * Architect's Ruling
- * Dispute Review Board
- * Standing Arbitrator

Prevention

- * Risk allocation
- * Incentive for Cooperation
- * Partnering`

Commitment to Resolution

- *What's going to get in the way of getting this done?*
- *What do we intend to do about it?*
- *Who needs to be brought into the loop?*
- *Who should do what part?*
- *What information do we need?*
- *When shall we check in?*
- *What are the key deadlines?*

Compromise

- *Step back to view the forest through the trees*
- *What is the order of importance to the Owner (Cost, Time, or Quality)?*
- *What is reasonably inferred from the plans?*
- *Is there additional cost involved?*
- *Pick your battles*

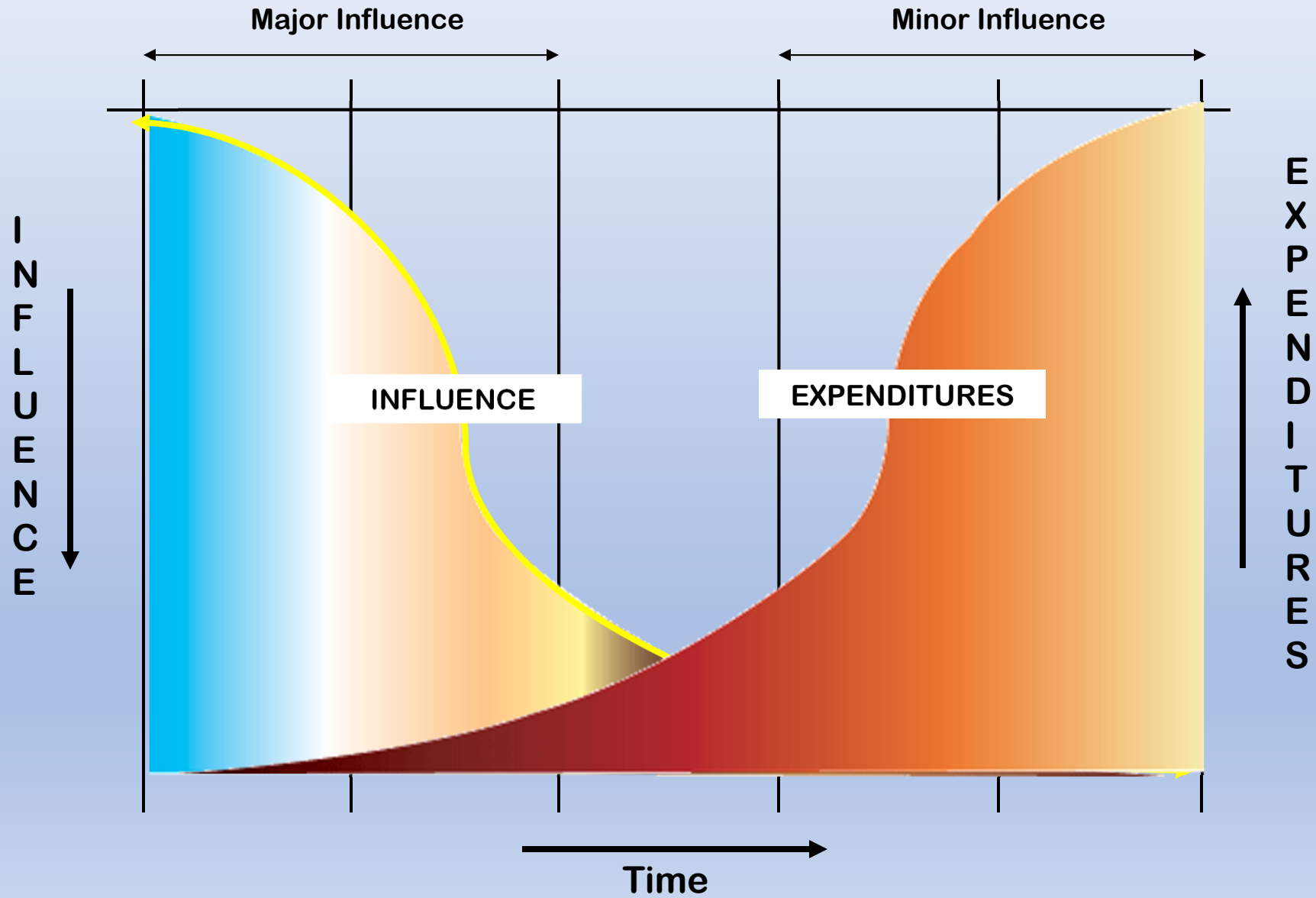


Reasons to Settle

- Savings in legal fees
- Time savings
- Emotional drain
- Salvaged relationship
- Uncertainty of outcome



Economic Realities of Claims



Summary

- Proper project planning and contract preparation
 - Effective contract negotiation
 - Project document review
 - Contract administration
- Proper management of the claims process
 - Project milestones and schedules Provisions
 - Notice Provisions
 - Change order provisions
- Swift and effective response to project issues
- Some claims are unavoidable
 - Minimize the impact



Questions and Discussion

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