

Wednesday October 18, 2023
ICRI 2023 Fall Convention

Conducting an Effective Structural Condition Assessment



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Conducting an Effective Structural Condition Assessment

Learning Objectives

1. Reinforce the importance of **defining** the **scope** of a Structural Condition Assessment during the proposal stage
2. Provide **guidance and tips** on conducting a Structural Condition Assessment
3. Discuss **transitioning** an assessment into a repair project, and the designer's role as the project progresses.
4. Discuss **ACI 562** and the changing paradigm of the standard of care within the concrete repair

Conducting an Effective SCA

Outline

1. **Background**
2. **Initiation**
3. **Assessment**
4. **Reporting**
5. **Repair**
6. **Beyond...**

1 – Defining Scope

2 – Guidance and Tips

3 – Transitioning

4 – ACI 562

Section 1: Background

What is an SCA?

Many things...

Reasons Vary:

- Scoping for Repair Project
- Mandated by AHJ – Public Safety
- Due Diligence - Real Estate Transaction
- Feasibility Study
- Forensics/Litigation

Background	Initiation	Assessment	Reporting	Repair	Beyond
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What is Included?

Many Things...

1 – Defining Scope

Scope Varies:

- **Structural Elements**
 - Primary vs Secondary
 - Targeted (Only Distressed/Damaged) vs General

Background

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What is Included?

Many Things...

1 – Defining Scope

Scope Varies:

- **Structural Elements**
- **Nonstructural Elements**
 - Façade & Glazing
 - Finishes

Background

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What is Included?

Many Things...

1 – Defining Scope

Scope Varies:

- **Structural Elements**
- **Nonstructural Elements**
- **Attachments/Appurtenances**

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How Should an SCA Be Conducted?

It Depends...

1 – Defining Scope

Scope Varies:

- **Phases**

- Cursory vs Preliminary vs Detailed (ASCE 11 & ASCE 30)
- Phase 1 vs Phase 2 (FL Milestone Inspections)

Background	Initiation	Assessment	Reporting	Repair	Beyond
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How Should an SCA Be Conducted?

It Depends...

1 – Defining Scope

Scope Varies:

- Phases
- Level of Scrutiny
 - Post Event Damage Assessment vs In-Service Building
 - Litigation Support/Forensics vs Recertification

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How Should an SCA Be Conducted?

It Depends...

1 – Defining Scope

Scope Varies:

- Phases
- Level of Scrutiny
- Methodology
 - Visual Only vs NDT/NDE vs Destructive vs Load Testing

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So... What is an SCA?

It is what you and the client decide it is

1 – Defining Scope

Considering:

- AHJ requirements (if applicable)
- **Standard of Care**
- **Ethics**
 - ASCE Code of Ethics: *“first and foremost, protect the health, safety, and welfare of the public”*

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So... What is an SCA?

Resources:

- ASCE 11-99 – Guideline for Structural Condition Assessment of Existing Buildings
- ASCE 30-14 – Guideline for Condition Assessment of the Building Envelope
- ASCE MOP 130 – Waterfront Facilities Inspection and Assessment
- ASCE – Evaluation, Maintenance, and Upgrading of Wood Structures
- ACI PRC-364.1-19 – Guide for Assessment of Concrete Structures Before Rehabilitation
- ACI PRC-201.1-08 Guide for Conducting a Visual Inspection of Concrete in Service
- CASE – National Practice Guidelines for the Preparation of Structural Engineering Reports for Buildings
- ICRI 410.1-2008 – Guide for the Evaluation of Masonry Façade Structures
- Friedman, Donald – The Investigation of Buildings
- Ratay, Robert – Structural Condition Assessment
- TMS – Guide for Condition Assessment of Masonry Façades
- US Forest Service – Wood and Timber Condition Assessment Manual
- Local AHJ (Miami-Dade, Broward, City of Boca Raton, etc)

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Section 2: Initiating the Project

“My balcony is cracking...”

“I received a notice from the county...”

“We are about to purchase this property...”

“We survived the storm, but...”

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Initial Inquiry

- Request Information
- Clarify Deliverable 1 – Defining Scope
 - Specifically, what IS included
 - Report or Drawings?
 - cursory Analysis
 - What IS NOT included ... Yet 3 – Transitioning
 - Permit Drawings?
 - Bid Documents with Detailed Quantities?
 - Detailed Analysis of Existing Structure?
 - Code Compliance Review



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Initial Inquiry

- **Request Information**
- **Clarify Deliverable**
 - Specifically, what IS included
 - What IS NOT included
- **Clarify Schedule**
- **Manage Expectations**

Proposal & Scoping

1 – Defining Scope

- **Define Scope**
- **Define Fee**
- **Confirm Deliverables**
 - Not Only Define Scope, But Reinforce Scope
- **Confirm Schedule**
- **Follow-up on Previous Requests**
 - Existing Drawings!

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Proposal & Scoping

1 – Defining Scope

- **Define Scope**
- **Define Fee**
- **Confirm Deliverables**
- **Confirm Schedule**
- **Follow-up on Previous Requests**
- **Communicate** Additional Services
- **Communicate** Next Steps
- **Communicate** Assumptions

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Proposal & Scoping

1 – Defining Scope

- **Phasing**
 - Document Discovery?
 - Assessment
 - Document Review
 - Field Work
 - Reporting
 - Continuing Services
 - If Known at Proposal

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Proposal & Scoping

1 – Defining Scope

- **Phasing**
- **Limitations**
 - % of Balconies
 - % of Attics
 - Testing/Demo (& Associated Patching)
 - Methods To Be Utilized
 - Repair Cost Estimates

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Section 3: The Assessment

Contract signed...

... but first

Background

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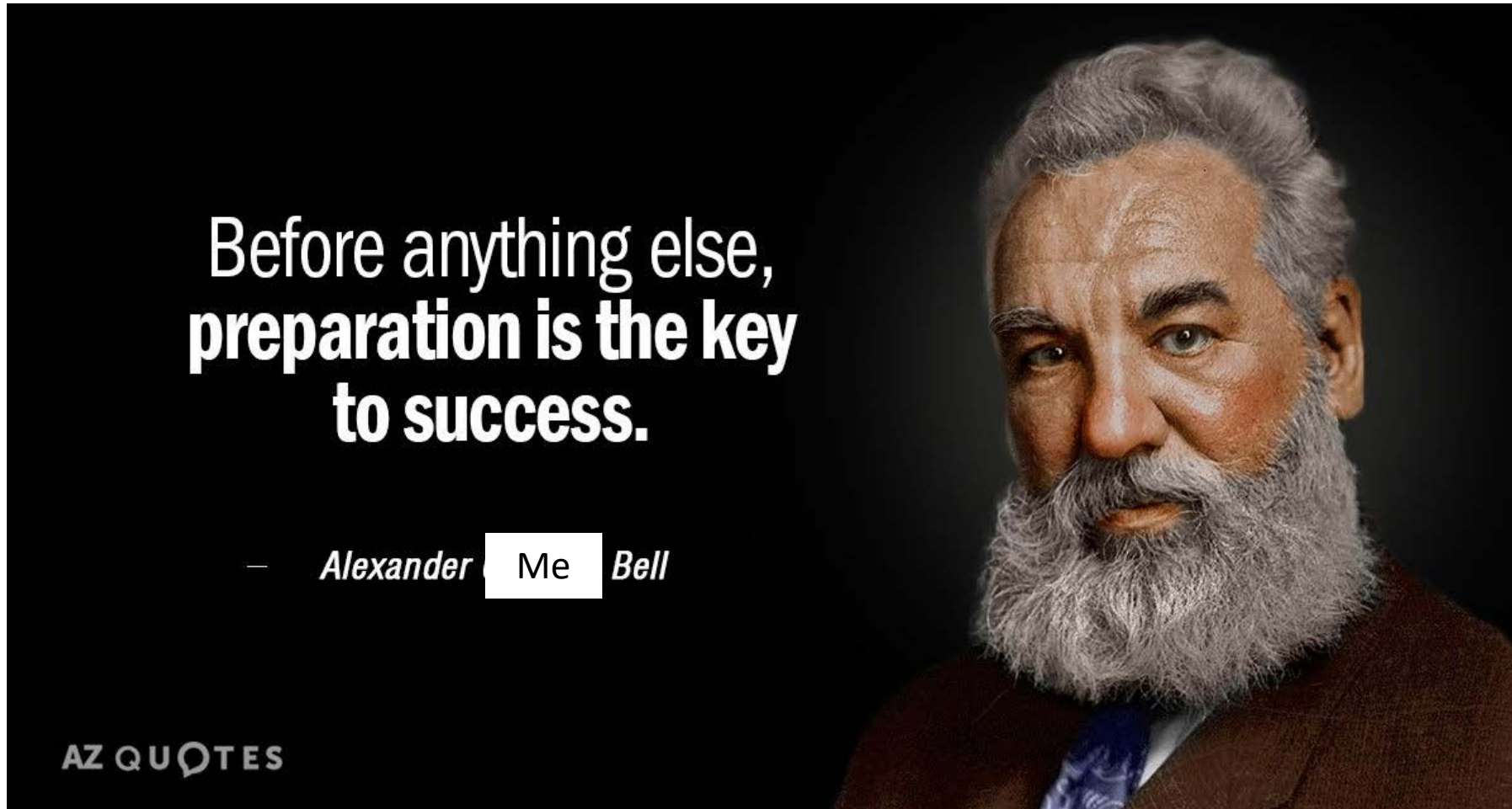
Reporting

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Section 3A: Preparation & Planning



Background

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Obtain Drawings / Documents

- **What?**
 - Original Drawings (A & S)
 - Shop Drawings
 - Inspection Reports
 - Previous Assessments
 - Renovation/Addition Drawings
- **How/From Where?**
 - Owner
 - Maintenance Team
 - Records Room
 - *Records Request
 - Previous Design Teams (Follow the Thread)

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Records Request

 **JustFOIA Notification** <donotreply@request.justfoia.com> Mon, 16 Oct, 09:19 (1 day ago) ☆ ↶ ⋮
to me ▾

The City of St. Pete Beach has received your Public Record Request for:

"PRR2023-352 - Monday, October 16, 2023 at 9:18 AM (Eastern Standard Time)" Your Request is being processed in accordance with Chapter 119 of the Florida State Statutes.

Request Number PRR2023-352 and Security Key not required

Your Request will be forwarded to the relevant City department(s) to locate the information you seek. Chapter 119.07(4), Florida Statutes, provides for fees to process Public Records Requests that require extensive research and/or resources. You will be contacted about the availability and/or any fees required. If no extensive search fees are assessed, you will be contacted when your request is complete.

 **JustFOIA Notification** <donotreply@request.justfoia.com> 10:45 (11 hours ago)
to me ▾

Hello,

The request [Request Number: PRR2023-352](#) has been completed.

If you have any questions, please contact the St. Pete Beach City Clerks office at cityclerk@stpetebeach.org or call 727-363-9201.

Thank you,

Amber LaRowe
City Clerk
City of St. Pete Beach
155 Corey Avenue
St. Pete Beach, FL 33706
Phone: 727.363.9220
Fax: 727.541.8040

**Note: This is an automated email notification. Please do not respond to this email.*

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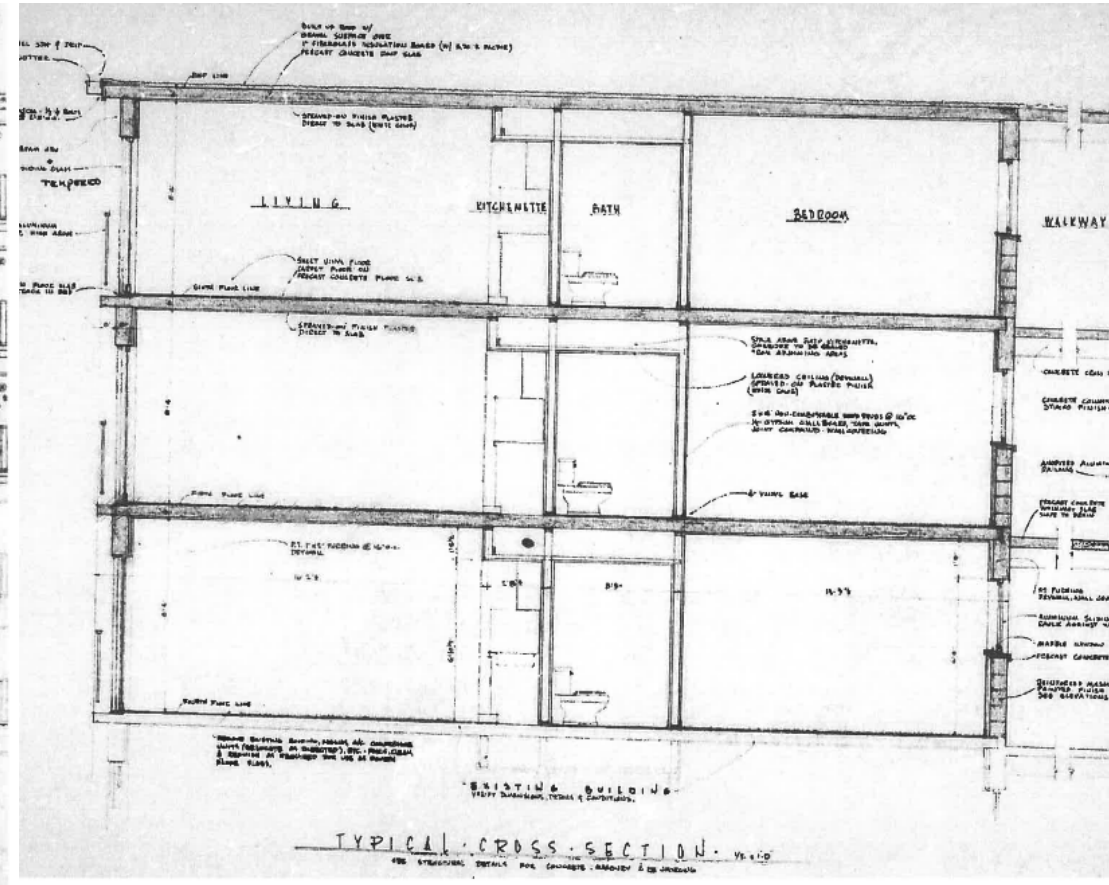
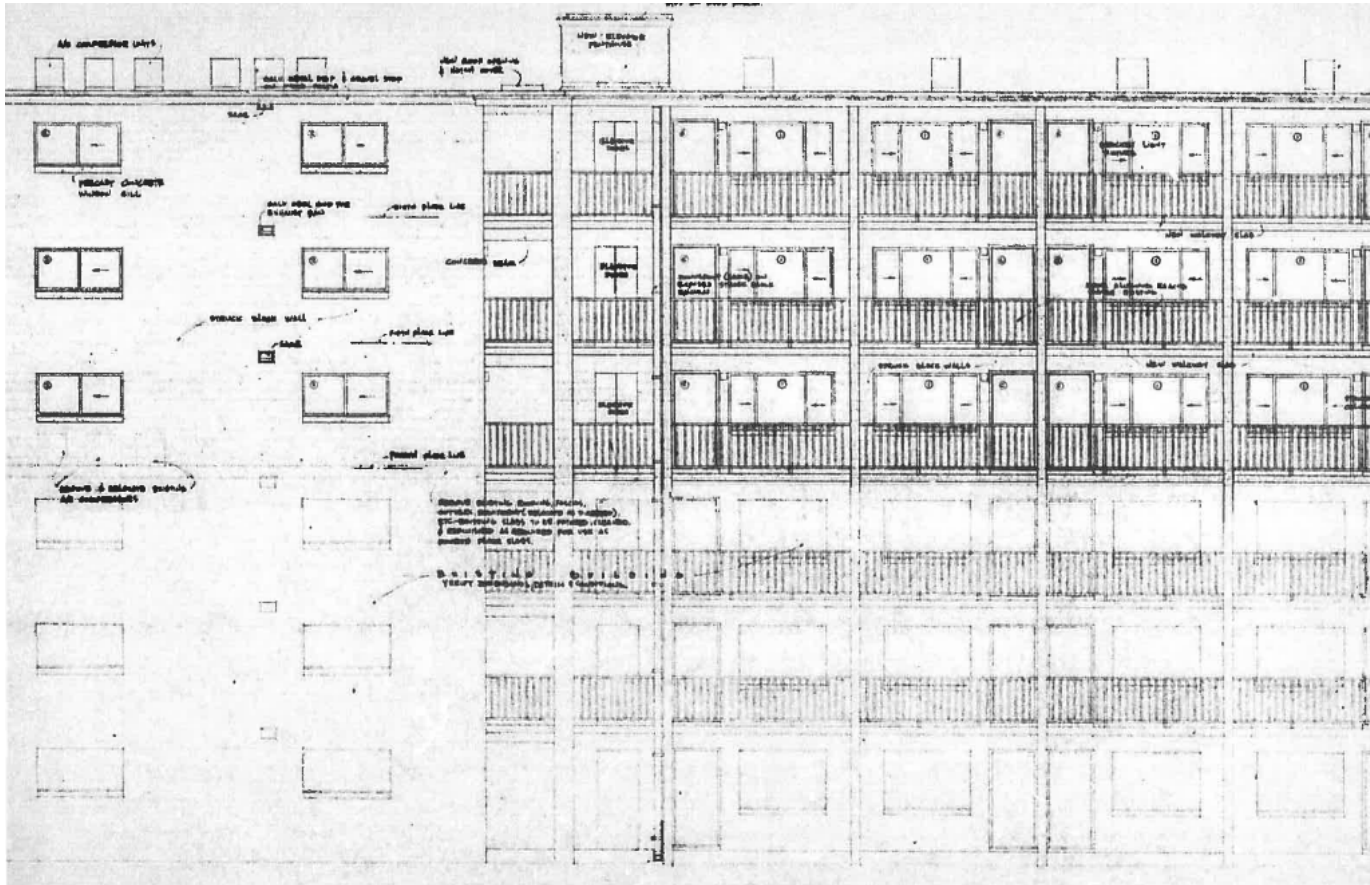
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Records Request



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Struck Out?

- **Try Again (Particular That Records Room...)**
- **Seriously, the importance of existing drawings can't be overemphasized**

Still Struck Out?

- **All Is Not Lost...**
 - Historical Photos
 - Sanborn Fire Maps
 - National Structure Inventory
 - Property Tax Information
 - Google
 - Field Verification (Additional Service?)

Research

- **Study Drawings**

- Systems
- Materials
- Design Loads
- Load Path
- Joints
- Details
- Unique Features/Irregularities
- ...and Bookmark Drawings!

5. CONCRETE: SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED IN PLANS.
6. REINFORCING STEEL: SHALL CONFORM TO A.S.T.M. A-615, GRADE 60 AND SHALL BE FREE OF RUST FLAKES, MILL SCALE, PAINT OR OTHER COATINGS THAT WILL REDUCE BOND. ALL REINFORCING SHALL BE ACCURATELY LOCATED AND FIRMLY HELD IN PLACE BEFORE AND DURING THE PLACING OF CONCRETE BY MEANS OF WIRE SUPPORTS. ALL BARS SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH THE A.C.I. BUILDING CODE (LATEST EDITION) AND THE LATEST MANUAL OF STANDARD PRACTICE (A.C.I. 315). SHOP DRAWINGS OF ALL REINFORCING STEEL MUST BE APPROVED BY THE ENGINEER BEFORE FABRICATION.
7. STRUCTURAL STEEL: SHALL CONFORM TO THE LATEST A.S.T.M. A-36 SPECIFICATIONS AND SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST A.I.S.C. STEEL CONSTRUCTION MANUAL. ALL STRUCTURAL STEEL SHALL RECEIVE ONE SHOP COAT OF APPROVED PAINT. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE FABRICATION.

DESIGN LOADS:

SUPERIMPOSED DEAD LOAD (PARTITIONS):	15 P.S.F.	LIVE LOAD BALCONIES	80 P.S.F.
CEILING	5 P.S.F.		
MASONRY	55 P.S.F.		
LIVE LOAD (APARTMENTS):	40 P.S.F.	LIVE LOAD STAIRS	100 P.S.F.
LIVE LOAD (CORRIDORS):	80 P.S.F.		

2 – Guidance and Tips

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Research

- Study Drawings
- Code Year/Version

WORK SHALL CONFORM TO THE SOUTHERN STANDARD BUILDING CODE, TO THE ACI CODE...

~~WORK SHALL CONFORM TO THE SOUTHERN STANDARD BUILDING CODE, TO THE ACI CODE FOR SAME CODE, AND THE CODE FOR OPERATIONAL STAGE.~~

- Easy Way = On Drawings Directly (Not Always So Easy)
- Hard Way = By Year & Region
 - Building Code Chronologies

1. DATUM: REFERENCE ELEVATION 0'-0" IS TOP OF FINISHED GROUND FLOOR SLAB.

2. GOVERNING BUILDING CODE: SOUTHERN STANDARD BUILDING CODE

3. DESIGN LIVE LOADS:

FLOORS.....	40 psf
ROOF.....	20 psf
BALCONIES.....	40 psf
CORRIDORS.....	100 psf
STAIRS.....	100 psf
MECHANICAL EQUIPMENT ROOM & PARKING GARAGE ROOF.....	150 psf
WIND.....	in accordance with Southern Standard Building Code or other appropriate code.
PARKING GARAGE FLOOR.....	50 psf

Choose those applicable:

ORDINANCE NO.	ADOPTED	EFFECTIVE	CODE ADOPTED	AMENDMENTS ADOPTED
Zoning Resolution 4A-60	4/24/60	4/25/60		1960 Amendments to the 1953-54 Revisions of the SSBC
Zoning Resolution 4B-60	9/12/60	9/12/60		1960 Amendments to the 1953-54 Revisions of the SSBC
Resolution Dated 2/19/62	2/19/62	2/19/62	1960-61 Revisions to the SSBC	
Resolution Dated 10/8/62	10/8/62	10/8/62		1962 Amendments to the 1960-61 Revisions of the SSBC
Zoning Resolution 4A-63	4/8/63	4/8/63		1963 Amendments to the 1960-61 Revisions of the SSBC
Resolution Dated 7/22/63	7/22/63	7/22/63		1963 Amendments to the 1960-61 Revisions of the SSBC
Resolution Dated 10/28/63	10/28/63	10/28/63		1963 Amendments to the 1960-61 Revisions of the SSBC
Resolution Dated 1/13/64	1/13/64	1/13/64		1964 Amendments to the 1960-61 Revisions of the SSBC
Resolution Dated 5/11/64	5/11/64	5/11/64		1964 Amendments to the 1960-61 Revisions of the SSBC
Resolution Dated 6/22/64	6/22/64	6/22/64		1964 Amendments to the 1960-61 Revisions of the SSBC
Resolution # 7	6/22/64	6/22/64	1962 NEC	1964 Amendments to the 1962 NEC
Resolution Dated 7/13/64	7/13/64	7/13/64		1964 Amendments to the 1962 NEC
Resolution Dated 9/21/64	9/21/64	9/21/64		1964 Amendments to the 1960-61 Revisions of the SSBC

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Research

- **Study Drawings**
- **Code Year/Version**
- **Previous Repairs/Renovations**
- **Previous Permits**

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Create “Packets” or “Forms”

2 – Guidance and Tips

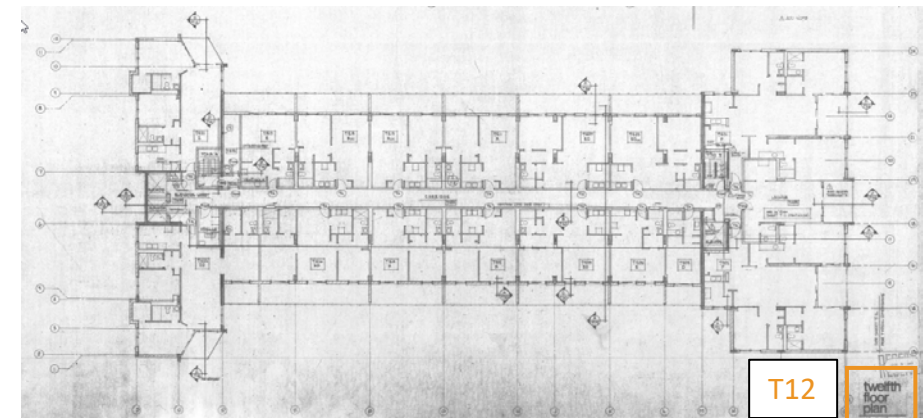
- Wayfinding
- Note Taking
- Confirmation of Original Design
- Annotate for Ease-of-Use in Field
- Keyplans if Campus

WEST EAST

UNIT NUMBER: _____
DATE: _____
TIME IN: _____ TIME OUT: _____
ENGINEER: _____
FINDS IN PLACE: _____
NOTES: _____

LEGEND:
HE - HOLD UP SOUND APPROXIMATE FLOOR AREA (NONE)
CI - CRACKS (LINE PHOTO WITH CRACK COMPARATOR)
CO - CORROSION
SP - VISIBLE SPALLING
SW - STAINING (WATER STAINING / RUST STAINING)
FC - FINISH CRACKING
RI - RAILING

Logo Balcony Inspection Form Date Issued: 07/10/23 Project No.: 23-14-000 Sheet No.: S-04



Background	Initiation	Assessment	Reporting	Repair	Beyond
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Client Communication

- **Logistics**
 - Arrival
 - Parking
 - PPE

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Client Communication

- **Logistics**
- **Access & Escorts**
- **Equipment Needs**
- **Working Hour Limitations**
- **Manage Expectations**
 - Timing/Duration
 - Representative Sampling Objectives/Parameters

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Client Communication

- **Logistics**
- **Access & Escorts**
- **Equipment Needs**
- **Working Hour Limitations**
- **Manage Expectations**
- **Prime Interview**
 - Who & When
 - Send Questionnaire

Background

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Client Communication

- **Logistics**
- **Access & Escorts**
- **Equipment Needs**
- **Working Hour Limitations**
- **Manage Expectations**
- **Prime Interview**
- **Confidentiality**

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Staffing

- **Training**
- **Credentials & Experience**
- **Clearance/Badging**
- **Physical Limitations**
 - Mobility
 - Heights
 - Truss Walking

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Staffing

- **Training**
- **Credentials & Experience**
- **Clearance/Badging**
- **Physical Limitations**
- **Handwriting**
 - Only half kidding here

Staffing

- Training
- Credentials & Experience
- Clearance/Badging
- Physical Limitations
- ~~Handwriting~~ Technical Writing

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Assemble Field Kit

Definitely Yes

- Camera (Preferably Phone)
- Water ++

Obviously Yes

- Appropriate Footwear
- Appropriate Apparel (Considering Weather)
- Appropriate PPE

If Scope Requires

- NDT/NDE Apparatus
- Crack Gauges

Highly Recommended

- Packets/Forms & Checklist
- Flashlight and/or Headlamp (*With Backup Batteries)
- Taper and/or Laser
- Multi-Tool
- Clipboard with Pens (Multiple Colors)
- Crack Comparator
- Hammer (or Other Acoustic Sounding Device)
- Watch (for Timestamps)
- Sun Protection (Roof Work)

Might Be Nice

- Tablet
- Awl
- Rebar Locator
- Makeshift Crack Gauges
- Mask
- Feeler Gauges
- Caliper
- Utility Belt/Pouch/ Bag
- Moisture Meter
- Etc...

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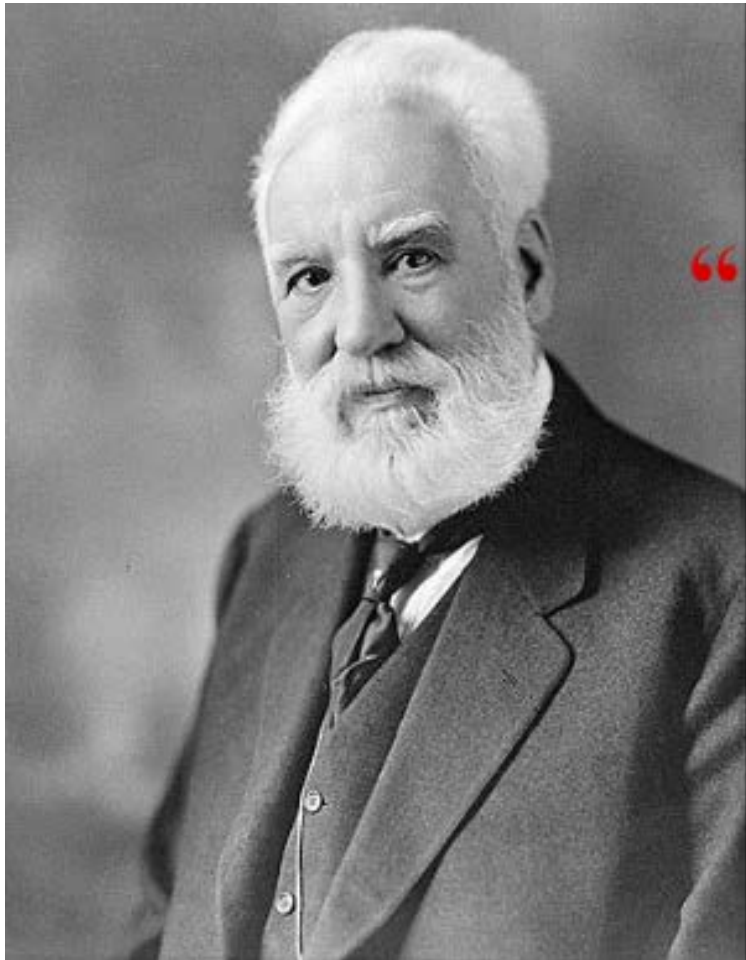
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Section 3B: Field Work



“ There cannot be mental atrophy in any person who continues to observe, to remember what he observes, and to seek answers for his unceasing hows and whys about things. ”

~ Alexander Bell

QuotesCosmos

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...But First...Dayplanning

- **Confirm Access Limitations**
- **On-Site Communication Methods**
 - Internal
 - External

...But First...Dayplanning

- **Confirm Access Limitations**
- **On-Site Communication Methods**
- **Escort Protocol and Schedule**
- **Probe/Exploratory Demo Protocol**
- **Manage Expectations**

Communication & Managing Expectations

Background

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...But Second...The Interview

- **Someone Familiar With Building History, Operations, & Maintenance**
- **Inquire About**
 - **Known Issues**
 - The Obvious Stuff
 - Cracking/Spalling
 - Water Intrusion
 - Corrosion/Exposed Rebar

Background

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...But Second...The Interview

- **Someone Familiar With Building History, Operations, & Maintenance**
- **Inquire About**
 - **Known Issues**
 - The Obvious Stuff
 - The Less Obvious Stuff
 - Doors/Windows Jamming
 - Vibrations
 - “Rolling Marbles”

Background

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...But Second...The Interview

- **Someone Familiar With Building History, Operations, & Maintenance**
- **Inquire About**
 - Known Issues
 - Previous Repairs
 - System Ages
 - Roof
 - Façade
 - Waterproofing

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...But Second...The Interview

- **Someone Familiar With Building History, Operations, & Maintenance**
- **Inquire About**
 - Known Issues
 - Previous Repairs
 - System Ages
 - Planned Future Projects
 - Specific Conditions Client Wants Eyes On
 - Anything Else Pertinent To Scope

Background

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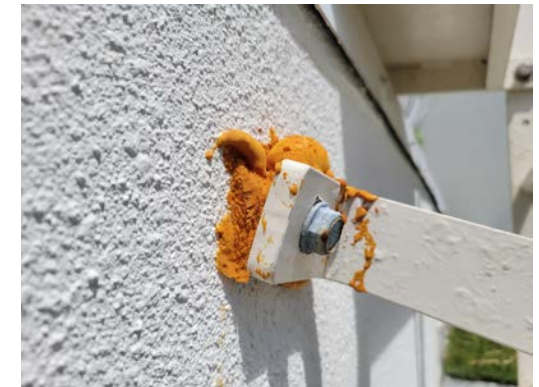
Repair

Beyond

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...But Third...Safety

- **Mold**
- **Heights/Fall Protection**
- **Unsafe/Dangerous Conditions***
- **Confined Spaces**
- **Asbestos**
- **Ladders**
 - Temporary = Tie-Off
 - Permanent = Connections



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Methodology

- **Systematic**
 - Level-by-Level, Building-by-Building, Not Random
 - Try Not To Get Derailed
 - New Observations Affecting Previous Areas
 - Consider Causes of Distress Rather Than Symptoms

Background

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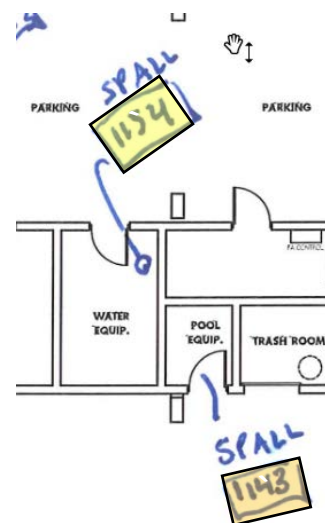
Repair

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Methodology

- Systematic
- Representative
- Intentional
- Well-Documented
 - Annotated Plans (Packet/Forms)
 - Time Stamped Photos
 - Floor & Unit Plates
 - Clarify Level (Standing on vs Observing)
 - Note Access & Limitations/Locked Areas



- 20211014_113410
- 20211014_113414
- 20211014_113419
- 20211014_113459
- 20211014_113521
- 20211014_113546
- 20211014_113621
- 20211014_113627
- 20211014_114039
- 20211014_114045
- 20211014_114049
- 20211014_114144
- 20211014_114145
- 20211014_114149
- 20211014_114220
- 20211014_114223
- 20211014_114227
- 20211014_114358
- 20211014_114431



2 – Guidance and Tips

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Methodology

- **Systematic**
- **Representative**
- **Intentional**
- **Well-Documented**
- **Specific Methods Employed As Scoped**
 - Visual Only or Visual + Sounding
 - NDE/NDT
 - Exploratory Demo

1 – Defining Scope

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On-Site Communication

- **Sensitive Discussions/Observations**
- **Don't Commit To Anything**
- **Have Client “Get Eyes On” Certain Observations, Particularly Substantial**

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What To Look For

- **Damage/Deterioration/Distress**

- **Direct**

- Cracking/Spalling
- Corrosion
- Exposed Rebar

- **Indirect**

- Finish Cracking
- Water Staining
- Deflections



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What To Look For

- **Damage/Deterioration/Distress**
 - Direct vs Indirect
 - Potentially Dangerous/Unsafe Conditions
 - Substantial Structural Damage
 - LFRS
 - GFRS



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What To Look For

- **Damage/Deterioration/Distress**
- **Deviations/Discrepancies From Drawings**
- **Previous Repairs**



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What To Look For

- **Damage/Deterioration/Distress**
- **Deviations/Discrepancies From Drawings**
- **Previous Repairs**
- **General Conditions & Exposure**



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What To Look For

- **Damage/Deterioration/Distress**
- **Deviations/Discrepancies From Drawings**
- **Previous Repairs**
- **General Conditions & Exposure**
- **Code Requirements...Sort of**
 - Typically not scoped for full code compliance review, but if you see something obvious, note it and qualify in report
 - Existing building doesn't HAVE TO comply with current code

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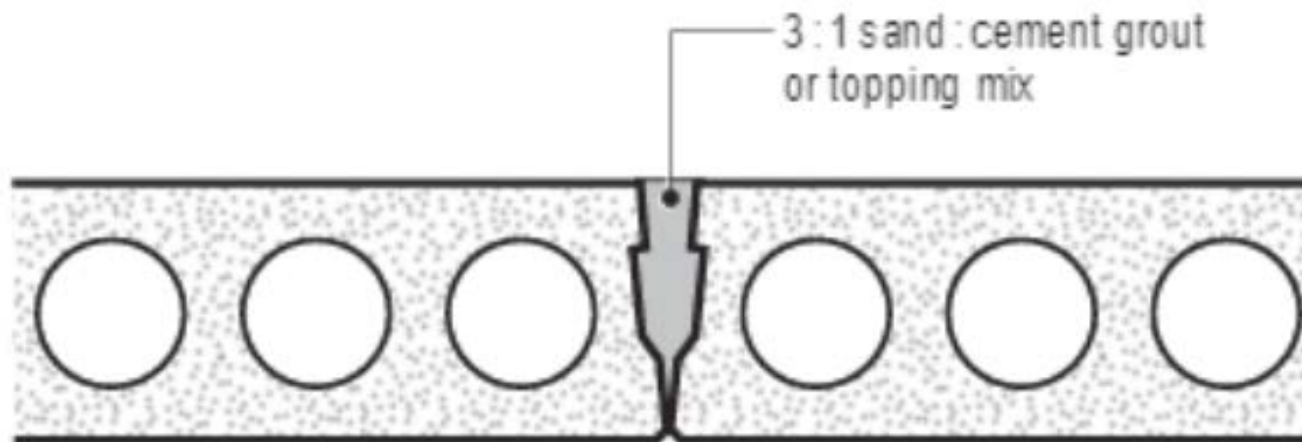
Repair

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What To Look For

- **Damage/Deterioration/Distress**



GROUTED KEY DETAIL

- **Faulty Construction**



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Where To Look

- **Exposed Conditions**
 - Roofs
 - Exterior
 - Balconies
 - Parking Areas (Particularly If Elevated, or Below Elevated Building Above)

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Where To Look

- **Exposed Conditions**
- **Transitions**
 - Joints Between Buildings
 - Joints Between Materials
 - Joints Between Elements
 - Interior-to-Exterior
 - Elevated-to-On Grade
 - Stiffness Discontinuities

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Where To Look

- **Exposed Conditions**
- **Transitions**
- **High Stress Areas**
- **Non-Redundant or Interrupted Load Paths**
- **Out-of-Sight / Out-of-Mind Areas**
 - BOH
 - Appurtenances
 - Storage

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Where To Look

- Exposed Conditions
- Transitions
- High Stress Areas
- Non-Redundant or Interrupted Load Paths
- Out-of-Sight / Out-of-Mind Areas
- Representative Sampling Of All
- As Scoped/Required

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Field Work Recommendations

2 – Guidance and Tips

- **Document, Document, Document**
 - Time Stamps Correlated To Location & Orientation
 - Shorthand Descriptions + Legend
 - Progressive Photos (Distance/Zoom)

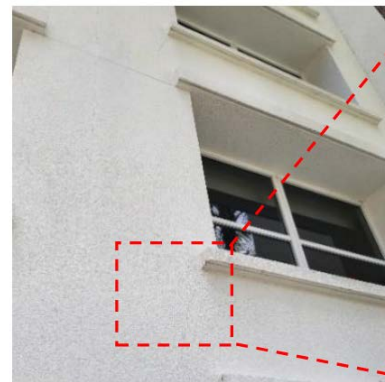
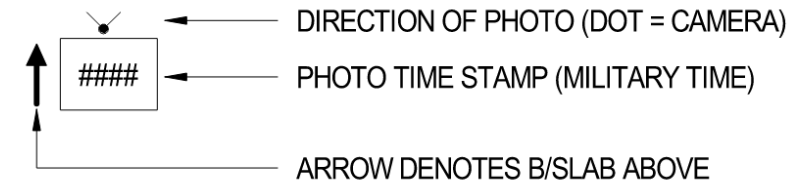


Photo 2.3.17-1: Cracks at Wing C Courtyard



Photo 2.3.17-2: Crack at Bottom of Window



COMMON ABBREVIATIONS:

HS = HOLLOW SOUND (ANNOTATE PLAN AREA ABOVE)
Cr = CRACKING (TAKE PHOTO WITH CRACK COMPARATOR)
Co = CORROSION
Sp = VISIBLE SPALLING
St = STAINING (WSt = WATER STAINING / RSt = RUST STAINING)
FCr = FINISH CRACKING
Ra = RAILING

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Field Work Recommendations

- **Document, Document, Document**
- **Out-of-Sight Out-of-Mind Areas**
- **Take Time To Consider Behavior**
- **Debrief**
 - Mid-Day
 - End-of-Day
 - End-of-Assessment

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Field Work Recommendations

- **Document, Document, Document**
- **Out-of-Sight Out-of-Mind Areas**
- **Take Time To Consider Behavior**
- **Debrief**
- **Digest Notes Into Outline (Very) Shortly After Field Work (Including Photo Timestamps)**

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Section 3C: Debrief

- **Internal**
 - Workshop Outline & Initial Report Organization
 - Review Checklist/Wishlist – Areas Omitted?
 - Discuss Observations & Behavior – Areas to Revisit?

Section 3C: Debrief

- **Internal**
- **External (Before Leaving)**
 - High-Level Notes to Client
 - Site Walk to Review Bigger Items
 - Areas Where Access Was Not Gained
 - Manage Expectations
 - Reporting Timeline
 - Next Steps and Subsequent Phase(s)
 - Follow-up Visit

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Section 4: Reporting

“

The achievement of one goal
should be the starting point
of another.

ALEXANDER Me BELL

GRACIOUSQUOTES.COM

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Organization & Formatting

- ASCE 11 and ASCE 30 (Good Starting Point)
- Local AHJ Requirements (Standard Forms)
- Document Research & Drawing Review
 - ACI 562 Basis of Design 4 – ACI 562
 - Existing Structural Systems
 - Original Building Code

Populating Report

- **Technical Writing Matters!!**
- **Consider Target Audience**
 - Owner
 - Contractor
 - Building Department

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Populating Report

- **Technical Writing Matters!!**
- **Consider Target Audience**
- **Leverage Previous Content**
- **Consider Behavior, Not Symptoms**
- **Required Content/Language**
- **Stick to Scope** 1 – Defining Scope
 - Don't Go Too Far but
 - Make Sure You Go Far Enough

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Observations & Recommendations

- **What Was Observed**
- **Why It Matters**
 - Consider Behavior
 - Communicate Risks

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Observations & Recommendations

- **What Was Observed**
- **Why It Matters**
- **Action Recommended**
 - Resolve The Issue, Not Symptoms
 - Crack Treatments
 - ICRI On-Demand Webinar (Free For Members): *Understanding Cracks in Concrete, Preventing Their Occurrence, and Effectively Repairing Them*
 - ACI 224.1 – Causes, Evaluation, and Repair of Cracks in Concrete Structures

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What is Next?

- **Nothing? No Repair Required**
- **Additional Investigations**
 - Detailed Condition Assessment
 - NDE/NDT or Material Testing
 - ICRI 210.4R-2021 - Guide for Nondestructive Evaluation Methods for Condition Assessment, Repair, and Performance Monitoring of Concrete Structures
 - ACI PRC-228.2-13 – Report on Nondestructive Test Methods for Evaluation of Concrete in Structures

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What is Next?

- **Nothing? No Repair Required**
- **Additional Investigations**
 - Detailed Condition Assessment
 - NDE/NDT or Material Testing
- **Repair** 3 – Transitioning
- **Worse?**

Reporting Recommendations

- **Communicate Locations (Keyplans)**
- **Avoid Duplicate Information**
- **Priorities & Recommended Repair Timelines**
- **Maintain Consistent Voice/Tense/Format**
- **Include Definitions Section**

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Issuing The Report

- **Communicate Along The Way**
 - Debrief
 - Outline
 - Draft(s)
 - Final

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Issuing The Report

- **Communicate Along The Way**
- **Discuss Continuing Services & Next Steps**
 - Be Proactive, But Not Pushy
 - Provide Client With Information & Recommendations, and Establish Where You Fit In The Process Going Forward
- **Owner Meeting To Discuss Conclusions**

3 – Transitioning

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Section 5: Repair Phase

- **ICRI On-Demand Webinars (Free For Members):**
 - *Concrete Repair: Exploring Effective Techniques, Materials, and Expert Insights*
 - *Basics of Post-Tensioning Repairs for Restoration*
- **ACI 562 & ACI 563 & ICRI 110 Series** 4 – ACI 562
- **ACI Concrete Repair Manual**
 - 546 – Guide to Concrete Repair
 - 546.3 – Guide to Materials Selection
 - RAP Documents
- **AISC Design Guide 15 – Rehabilitation & Retrofit**
- **PTI DC80.4-18: Guide Specification for Unbonded Post-Tensioning Repair**
- **PTI DC80.3-12: Guide for Evaluation and Repair of Unbonded PT Concrete Structures**
- **TMS - ARMS - Assessment and Retrofit of Masonry Structures**
- **+ Many Many Many More**

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Section 6: Beyond

- **Monitoring**
- **Maintenance & Structural Health Record**
- **Periodic Assessments (Balconies, Railings, Façade, Next Assessment/Recertification)**
- **Renovation/Expansion**
- **Next Repair Phase (Lower Priority Items)**
- **Referrals**

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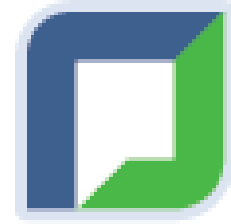
Questions?

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