

**Minutes of Meeting**  
**Committee 121**  
**Quality Assurance Systems for Concrete**  
**Duke Energy Convention Center**  
**Cincinnati, OH**  
**Monday, October 21, 2019**  
**10:00 AM to 12:00 PM**  
**Room: C-252**

**MEMBERS:**

Michelle E. Walters  
*Chair*

Thomas G. Tyler  
*Secretary*

**VOTING MEMBERS**

Godwin Q. Amekuedi

Mihaela Birley

Casimir Bognacki

Paul D. Brooks

Martin J. Fradua

Thomas M. Greene

John Hausfeld

Paul Hedli

Samuel J. Lines

Stephen Marchese

Anand S. Mehta

Jinesh K. Mehta

Oon-Soo Ooi

Jerry Parnes

Johan.. Schor

Eugene Takhtovich

James R. Turnham

Woody L. Vogt

**CONSULTING MEMBERS**

Alejandro Graf Lopez   Morris V. Huffman   Gajanan M. Sabnis   Paul Zoltanetzky, Jr.

**ASSOCIATE MEMBERS**

Mohd Basit

Keith S. Foster

Dean Frank

Mostafa Gad Alla

Arturo C. Gaytan

Jack Holley

David Mata

Huascar J. Paderes

Jose A. Rangel

Michelle Rector

Peter Stamps

Sumit Kumar Verma

Rongyun Xu

# Minutes of Meeting

## Committee 121

Monday, October 21, 2019

1. Call to Order and Welcome
2. Introduction of Members and Guests
3. Update of Membership Status
  - Keila Lombardozi is now an Associate Member.
  - Vance Robinson is now a Voting Member.
  - Michelle is continuing to contact voting Members who have not been attending the meetings and ask after their intentions.
4. Establish Date of Next Meeting

Next meeting will be on Monday, March 30, 2020, 10:00 AM in Rosemont.
5. Attendance

Voting Members  
Michelle Walters, Thomas Tyler, John Hausfeld, Sam Lines, Michaela Birley, Jim Turnham, Keila Lombardozi, Vance Robinson, Phil Gray, Tara Cavalline

Guests  
Sureka Sumanasooraya (ACI Staff), Mike Tholen (ACI Staff), Larry Kahn (TAC Contact), G. Ben Reese, Kyle Krammer, Lizzy Stark

(See Attachment A for sign-in sheet.)  
Also see Attachment B for Jim's Additions to the Minutes.
6. Approval of Minutes from Quebec City, QC

Minutes approved. No comments.
7. Announcements
  - Chair's Breakfast Update:
    - Call for Committee members to consider signing up to review documents for ACI Journals.
    - ACI Certifications, ACI 121 was listed as a document that is used in the certification process.
8. Old business:
  - A. Replacement of the existing document – 121R-08 -Guide for Concrete Construction Quality Systems in Conformance with ISO 9001
    1. Request to TAC for new document – Document Development Request form was issued to TAC in May, 2019.
    2. Present status of the Table of Contents and Main Body of Text  
Reviewed and agreed required formatting and adjustments for content. Michelle will review and recirculate revised document to the subcommittee team.

3. Comments on Jim Turham's Appendix 6.0 - Corporate Quality Plan Template

- Jim presented his last revision of the Template, dated 10/20/19.
- He also presented an abbreviated Quality Plan based on something John had provided. (Attached – Appendix C)
- It was generally agreed that the Template was a large task to take on and would need a lot of work.
- Placed on the table for consideration was the following:
  - Chapter 6 be made into a transitional chapter to present the top ten considerations from the five basic industry players as listed below:
    - Owner
    - Designer
    - Contractor
    - Subcontractor
    - Inspection Laboratory

From these we can refer to the different sections of the Template as starting points to develop methods to address those “top tens.”

4. New Business  
None


10. Open discussion on ideas for new projects

- A. Ideas for sessions  
None presented
- B. Ideas for a new document or report  
None presented
- C. Enhancements for the “Audit Document”  
None presented

8. Adjourn

The meeting was adjourned at 12:00 noon.

Michelle Walters \_\_\_\_\_



Chair

Tom Tyler *Tom Tyler* \_\_\_\_\_

Secretary

Attachments:

Appendix A – Sign in Sheet

Appendix B – Baker QCP Modified *Jim's additions to the Minutes*

*Appendix C - Baker Subcontractor Template Reverse Engineered by Jim*

Members,

My apologies for the cut and paster set of Minutes. I am working from home in these trying times and do have all the equipment and tech savvy to pretty this up. Please join us for our next meeting in cyberspace to push this new document ahead.

Tom Tyler, Secretary



Committee Meeting Sign In Sheet\*\*

Page: 1

Committee: ACI 121		Date: 10-21-2019		
Name and Address (Please Print): * Members - Please give address, phone number, and e-mail only if changed * Visitors - Please give complete address, phone number, and e-mail			Comm. Member ?	Visitor? **
Michelle Walters			✓	
Jim Turnham (from Vancouver BC)			✓	
Sureka Sumanasooriya (ACI staff)				✓
G. BEN REESE RABA KISTNER CONSULTANTS INC brrese@rkci.com 210-699-9090				✓
Kyle Kammer Baker DC KammerK@bakerdc.com 513-267-9130				✓
Keila Lombardozzi Clark Concrete Contractors, LLC			✓	
John HUSTELO BAKER Concrete Construction, Inc			✓	
Lizzy Stark Terracon Consultants				✓
Mike Tholen ACI				✓
<del>THOMAS HLEZ</del>			✓	
SAM LINES			✓	
TARA CAVALLINE UNC CHARLOTTE			✓	
Yance Robinson			✓	
Larry Kahn (IAC contact)				✓

**\*Technical Committee Attendees:** The purpose of an ACI technical committee is to reach consensus and publish information on concrete-related issues within its mission. The discussions at the committee's meetings are part of the this consensus process, and are not the official position of the committee. Only a published committee document represents the formal consensus of the committee and the institute.

\*\*Visitors interested in committee membership should contact the chair or visit the ACI website, [www.concrete.org](http://www.concrete.org), for a membership application.

## Appendix B - Jim's Comments on the Minutes of the Meeting

- Jim presented his last revision of the Template, dated 10/20/19.
- He also presented an abbreviated QMP 2.5 00 00 00 Subcontractor Quality Plan based on something John had provided. (~~Attached – Appendix B & C~~)
- It was generally agreed that the Quality Plan Template was a large task to take on and would need a lot of work. JT: The document is large, yes. That said, just prior to the Cincinnati meeting, we heard back from ACI TAC: The Quality Plan Template can be issued as John H had alluded to, considered “Committee Content” – it does not need the level of review that a normal ACI document requires.
- According to Shannon Banchero (ACI Manager, Technical Documents) (October, 2019) phone call followed by Oct 8 and Oct 11 email; the Quality Plan Template can be provided in Word format, and needs 3 reviewers. That’s it.
- Shannon stated that the Quality Plan Template will be a stand-alone document – a template. And the QP Template can have appendices. The Template will be made available at the ACI book store for free!
- Placed on the table for consideration was the following:
  - Chapter 6 be made into a transitional chapter to present the top ten considerations from the five basic industry players as listed below:
    - Owner
    - Designer
    - Contractor
    - Subcontractor
    - Inspection Laboratory

Added by Jim.

From these we can refer to the different sections of the Template as starting points to develop methods to address those “top tens.”

#### 4. New Business None

10. Open discussion on ideas for new projects
- A. Ideas for sessions  
None presented
  - B. Ideas for a new document or report  
None presented
  - C. Enhancements for the “Audit Document”  
None presented

8. Adjourn  
The meeting was adjourned at 12:00 noon.

Michelle Walters \_\_\_\_\_  
Chair

# Appendix C - Baker Subcontractor Template (Reverse Engineered by Jim)

[Logo]	<b>QMP 2.5 xx xx xx Subcontractor Quality Plan Template</b>	Removed track chgs	A Revision
	<b>To be reviewed by ACI Committee 121</b>	Page 1 of 7	<b>updated 2020-03-12</b>

**QMP 2.5 xx xx xx - Subcontractor Quality Plan Template**  
Reverse engineered from the **Concrete Sub-contractor Concrete Plan- Example**

This has been reverse engineered based on the (Baker) concrete subcontractor quality plan. The objective is to create a generic Subcontractor Quality Plan Template from the best practice concepts provided by this specific "concrete" subcontractor quality plan.

We recognize Subcontractor Quality Plan Template that construction project quality activities must be coordinated by the Contractor (GC) for all subtrades and stakeholders. The plan template is intended to be coordinated in accordance with the Construction Specifications Institute (CSI) Master-Format (six-digit numbering system).

[The author has been previously using QMP 2.5, for *Subcontractor Quality Plan Templates* and this version QMP 2.5 xx xx xx fits into our directory with that extra Master-Format numbering capability.]

This QMP 2.5 xx xx xx Subcontractor Quality Plan Template is proposed as a template and numbering system for all subtrade Quality Plans.

**Limit of Liability:** The authors of this documented procedure, shall not be liable for any errors or omissions resulting in loss or injury of any kind from use of this document. The user shall make changes to reflect how they plan and perform these processes and shall submit any changes to the authority having jurisdiction prior to use of this document. Ownership of this document resides with the document user.

The purpose of this Master Subcontractor Quality Plan, is to document activities and processes by Sub-contractor ..... prior to, during, and after installation of its scope of work to meet contract requirements; and for concrete subcontractors, this would include ACI 301, ACI 117.

Table of contents:

MasterFormat trade number	Section	Template based on Subtrade 03 00 00 – Concrete (incl concrete sub-sub trades such as supply, form, rebar, place, pump, finish, cure)	Exhibit or QMP #	Specification Reference
03 00 00		<b>Project Description</b>		
03 00 00	<b>1</b>	<b>Project Information</b>		
03 00 00	<b>2</b>	<b>Scope of Work, including drawings and specifications</b>		
03 00 00	<b>3</b>	<b>Personnel Assignment(s) – Roles and Responsibilities</b>		01 4000
03 00 00	<b>4</b>	<b>Additional Qualified Co-workers</b>		01 4000 01 4000 01 4000
03 00 00	<b>5</b>	<b>Organizational Chart</b>		01 4000
03 00 00	<b>6</b>	<b>Quality Statement and Philosophy</b>		01 4000

03 00 00	7	<b>Pre-Installation</b>			
		Update of this Subcontractor Quality Plan			
		Work Method and/or Inspection Checklist for our trade			
03 00 00		Document Control	A		
03 00 00		Requests for Information- RFIs	B		
03 00 00		Project Submittals (including submittal of this Subcontractor Quality Plan, Work Methods (WMs), inspection checklists)	C		
03 00 00		Building Information Modeling – BIM	D		
03 00 00		Mock-ups	E	01 4000	
03 00 00		Pre-Construction Quality Meetings (all parties)	F	03 3000	
		- WM Review Meetings (per QMP 4.2)			
		- Initial Inspection (per QMP 4.3)			
03 00 00	8	<b>Installation</b>			
03 00 00		Establish, Maintain, & Communicate Control Lines	G		
03 00 00		Pre-pour Inspections - Sub self-check, QC checking by GC and/or QA by Consultant	H	03 3000	
03 00 00		3 <sup>rd</sup> Party Testing Verification	I	01 4000	
03 00 00		Hot Weather Concreting	J	03 3000	
03 00 00		Cold Weather Concreting	K	03 3000	
03 00 00		Mass Concrete	L	N/A	
03 00 00	9	<b>Post-Installation</b>			
03 00 00		Post-Pour Inspections	M	03 3000 3.9	
03 00 00		Project As-Built(s)	N	03 1000 03 3000 3.9	
03 00 00		Repairs and Corrections			
03 00 00		Typical Rub and Patch Procedure	O	03 3000 3.10	
03 00 00		Non-Compliance Tracking and Resolution (per QMP 8.3)	P	SOW I.D.9	
03 00 00		Procedure for typical repair	Q	03 3000 3.10	
03 00 00		OFI – Opportunities for Improvement	R	SOW I.D.9	
03 00 00	10	<b>Project Specific Quality Requirements</b>	S		

Commented [HJ1]: If there is no mass we can delete

Commented [HJ2]: Combine with As built. As-built procedure to address both as built survey data and attesting statements of compliance regarding post placement curing, protection, strength development / formwork striping compliance data.

Commented [HJ3]: process to report and trend quality incidents and this is used to develop and improve practices, we only need to bolt on the mechanism for reporting "uses as is" or repair dispositions to our client. Since we are using RFIs to do this, this requirement can be added to the RFI procedure and there is no need to initiate a second process for NCR generation and tracking.

Commented [JT4]: I would not currently agree with using RFIs for NCs. RFI has a different purpose, and NCs will be buried in that process.

[NOTE: Can't seem to fix the above right-hand column width]

### 1. Project Information

- a. Project Name: **Example:**– Highrise Construction
- b. Project Address: **Example:**
- c. Owner: **Example:**
- d. Architecture Firm: **Example:**.
- e. Engineering Firm:
- f. Inspection Agency:
- g. General Contractor:
  - i. GC Project Manager:

Filename: QMP 2.5 xx xx xx - Subcontractor Quality Plan Template 2020-03-12



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- ii. GC Project Engineer:
- iii. GC Project Superintendent:
- iv. GC Quality Manager

**2. Scope of Work - Example:**

- a. Design drawings and specifications shall be identified by name, number, date, rev #
- b. Concrete scope of work includes all items addressed in the contract. This generally includes furnish and install formwork, reinforcing, concrete for foundations, superstructure including installing sleeves and embedded items that are furnished by others. Work includes the following elements - example:
  - i. Foundations: Pier Caps, Mats, spread footings, foundation walls, grade beams, slab on grade, thickened slabs, concrete topping slabs, concrete ramps, etc.
  - ii. Superstructure: Columns, walls, shear walls, tie beams, rakers, conventionally reinforced beam / slab and drop panel structural deck slabs, metal deck slabs, toppings, curbs, etc.
  - iii. Ancillary work: loading dock, structural stairs, water stops, concrete curbs, recessed and depressed slabs, coupling beams, box outs if noted on structural drawings, etc.

**3. Project Personnel Assignments – Roles and Quality Specific Responsibilities**

- a. Project Co-worker – examples:
  - i. Sub-contractor-Project Manager – Responsible for promoting quality and implementing quality related responsibilities at the project level, primarily with office staff. Facilitates changes in office resource allocation, when necessary, to appropriately address quality concerns. Name: Phone #: email:
  - ii. Sub-contractor Project Superintendent – Responsible for construction and managing the implementation of field related quality in conjunction with the Sub-contractor Project Manager, Sub-contractor Line & Grade Coordinator, and Sub-con tractor Quality Manager Name: Phone #: email:
  - iii. Sub-contractor Project Engineer – Responsible for executing elements of the Project Quality plan and assisting the Sub-contractor Project Superintendent, Sub-contractor Project Manager, Sub-contractor Line & Grade Coordinator, and Sub-contractor Quality Manager, as needed. Name: Phone #, email:
  - iv. Sub-contractor Quality Manager – Responsible for verifying the quality of the work, as well as coordinating, administering, and implementing the Quality Plan. Including review of documents related to quality, attending quality meetings, interacting with the client and associated companies on quality related items, and confirming compliance with the client’s quality program. Name: Phone #, email:
  - v. Sub-contractor Line & Grade Party Chief – Responsible for daily management of project specific layout for location and elevation, review of project drawings and specifications, collection of as-built data, and implementation of associated standard operating procedures. Name: Phone #, email:
  - vi. Sub-contractor Safety Representative – Responsible for verifying compliance with safety program and coordinating, administering, and implementing the safety program. Name: Phone #, email:

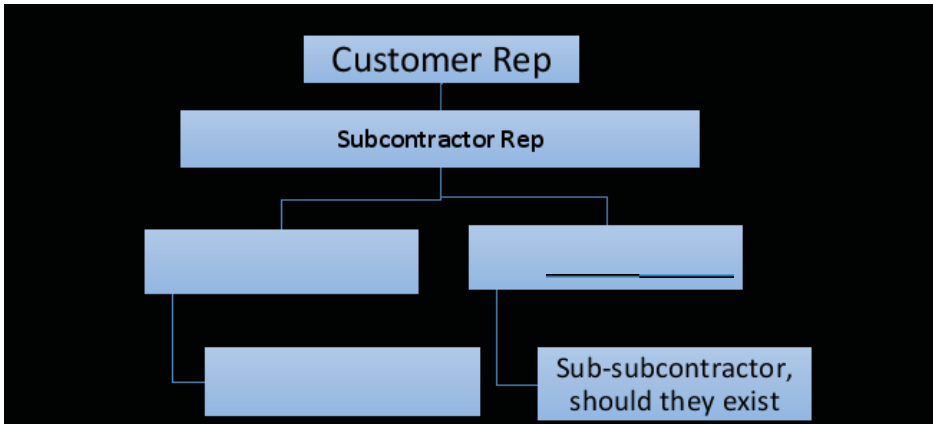


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Sub-contractor Foreman – Responsible for managing craft-workers and overall quality of the work being installed. Name: Phone #: email:

- vii. Sub-contractor Craft-Worker – Responsible for the quality of the work being installed.
- b. Support Co-workers – examples:
  - i. Sub-contractor Business Unit Leader – Responsible for promoting regional quality initiatives across regional projects. Name: Phone #: email:
  - ii. Sub-contractor Operations Manager – Responsible for periodically verifying quality plan implementation on projects in the region. Helps allocate resources to ensure proper implementation of quality programs. Name: Phone #: email:
  - iii. Sub-contractor BIM Formwork Services Manager – Responsible for coordination of modeling, formwork drawings, and constructability reviews. Works with Project Engineer to generate any necessary RFIs and the Party Chief to coordinate layout points and as-builts. Name: Phone #: email:
  - iv. Sub-contractor Corporate Quality Director (or Quality Manager) – Responsible for promoting corporate quality initiatives. Participates in Quality Plan development, maintenance, and periodic project reviews.

#### 4. Sub-contractor Organizational Chart



#### 5. Sub-contractor Quality Philosophy – example:

Sub-contractor implements a three-phase control system to ensure the quality of our work. Pre-installation, Installation, and Post-Installation.

- a. *Pre-installation Phase* – includes systemic and programmatic processes including writing or updating this Subcontractor Quality Plan, writing or updating Work Methods, writing or updating inspection checklists, Submittals for Owner's Rep review, RFIs, Document Control including

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drawings and specifications, Building Modelling, and Mock-ups. These processes are intended to help define and understand the owner's expectation for the subcontractor scope of work and to clearly communicate this to crews installing the work.

- b. *Installation Phase* – includes project layout control, Pre-pour Inspections, Notification of concrete pour to applicable parties, 3rd Party Testing Verification, Hot Weather Concreting Guidelines, Cold Weather Concreting Guidelines and Mass Concrete guidelines. The quality controls implemented during the installation phase are intended to help Sub-contractor confirm work is being installed correctly the first time.
  - c. *Post-Installation Phase* – includes process such as Post-Pour Inspections, Project As-Built(s), Repairs and Corrections. These are a final check to verify in-place work has been installed per plan and, if not, the process needed to remediate non-compliant work. Subcontract Closeout and Lessons Learned per QMP 10.1 and 10.2.
6. **Formal Qualification:** Certain duties performed require formal qualifications. When applicable and required by contract these include - examples: [examples to be changed to reflect the needs of your trade and your project or company]
- a. Sub-contractor Direct and Sub-tier Co-workers on Site
    - i. Sub-contractor Welder Qualifications – AWS D1.14
    - ii. Sub-contractor Post Tensioning Crew Leader – PTI Level II Installer or Level II Inspector
    - iii. Sub-contractor Concrete Finisher – ACI Flatwork Finisher
    - iv. Sub-contractor Quality Control Manager and/or Inspector – Sub-contractor Pre-Pour Inspector Training
    - v. Sub-contractor Field Engineer – Sub-contractor Field Engineering Group Training
    - vi. Sub-contractor Adhesive Anchor Installers – ACI Adhesive Anchor Installer Program
    - vii. Sub-contractor Vertical and Horizontal Forming & Shoring Inspectors – Sub-contractor F&S Inspection Program
  - b. Supply Chain Workers – examples:
    - i. Test Laboratories / Co-workers – ACI Level 1 Field and Level II Laboratory
    - ii. Place Finish Subcontractor – ACI Flatwork Finisher Certification
    - iii. Reinforcing Subcontractor - PTI Level II
    - iv. Delegated Formwork Designer – Professional Engineer licensed in [State-Province]
    - v. Delegated Design Specialist – Reinforcing / PT Detailers, etc. – Contract Documents
    - vi. Suppliers- Those performing factory acceptance test / inspections – Contract Documents
7. **Pre-Installation Quality- Requirements** are based on controlled project design documents and implementing procedures and forms identified herein. Generating RFIs through formal constructability reviews or informally as identified at the field level is strongly encouraged. Quality assurance shall include functions such as mix design optimization including submittal, and pre-construction meetings.

**[Note: "Exhibits" below are utilized by Baker Concrete and (for the time being are intellectual property and not provided). QMPs are discussed and available through the Quality Plan Template. This QMP 2.5 00 00 00 - Subcontractor Quality Plan Template has been added to the Quality Plan Template, as an attachment.]**

#### QMP 3.1.2 Subcontractor Submittals

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*QMP 3.2 Subcontractor Pre-Award (Post Bid) Meeting Agenda / Minutes 2020-03-12*

*QMP 4.1 – Pre-mobilization kickoff agenda), - Project start up*

*QMP 4.2 - Work Method Review Meeting 2018-10-02*

*QMP 4.3 - Initial Inspection 2018-10-02*

*QMP 5.1 - Job Start Checklist (an internal procedure),*

*QMP 5.4.x – Document Requirements for Subs, and QMP 8.1 Site Record Control*

*QMP 5.6 Writing RFIs and QMP 5.6.1 RFI form*

*QMP 7.2 - Calibration of Inspection and Measurement 2018-10-02 – if required*

*QMP 7.3 - Receiving Inspection 2018-10-02*

*Exhibit D – Building Information Modeling (no exhibit herein)*

Exhibit E – Mock-ups - For applicable concrete elements, installation mock ups shall be accepted using a Sub-contractor or General Contractor mock up form. Mock-ups should include various specified form finish / tolerance requirements and the related quality expectations.

Exhibit F – Pre-construction Quality Related Meetings. WM 1.1.1 Slab on Grade Work Method – note this WM covers many aspects of concrete activities in one document. This WM provided the elements noted below:

- i. Roles and Responsibilities – Internal
- i. Layout/Line and Grade Control - Internal
- ii. Concrete Place/Finish Plan – Internal,
- iii. Concreting Basics – External (John, do you mean drawings and specifications or do you mean preparation and equipment readiness for: pumping, placing, consolidation with vibrator, screeding, floating, finishing, curing?)
- iv. Tolerance Coordination – Elevator, Curtain Wall, Surface Finish, Other (See Tolerance BP) - External

8. **Installation – Requirements** include verification of work being installed prior to and during concrete placement to limit or eliminate deficiencies. Verification processes are aimed to address issues directly and indirectly relating to Baker's scope of work.

- a. Currently no exhibit – Concrete pour example: Notification of inspection event, subcontractor self-inspection completed and results recorded, provided to the level above (Contractor)
- b. Exhibit G – Line & Grade Project Control
- c. Exhibit H – Pre-pour Inspections - installation reviews shall be performed for each type of concrete element (footings, foundational walls, core wall, columns, and structural decks). All pre-requisite documents (e.g. Rebar shop drawings, Mix design Submittals, Concrete site access plans, if required, RFIs, etc.) and design document revisions shall be verified prior to signing a pre-placement checklist.

[Logo]	[Redacted]	<b>QMP 2.5 xx xx xx Subcontractor Quality Plan Template</b>	Removed track chgs	A Revision
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- d. Exhibit I – Interface with 3rd Party Inspection & Testing Agencies – Soils Inspection & Testing, Concrete Slump Test, Air, Unit Weight, Concrete Cylinders, PT & Rebar Installation, Concrete Placement Inspections, PT Stressing, Flatness/Levelness, Adhesive anchors, etc.
- e. Exhibit J – SOP Hot Weather Concreting
- f. Exhibit K – SOP Cold Weather Concreting
- g. Exhibit L – SOP Mass Concrete

**Commented [HJ5]:** Confirm no mass concrete

9. **Post-Installation – Requirements** include verification of installed work to identify, report, and address items out of tolerance. For continuous improvement in all regions, requirements also include input for best practice reviews.

- a. Exhibit M – SOP - Post-Pour Inspections
- b. Exhibit N – SOP - Project As-Built(s) and Post Pour Compliance Inspections
- c. Repairs and Corrections
  - i. Exhibit O – SOP - Typical Rub and Patch Procedure
  - ii. ~~Exhibit P – SOP - Non-Compliance Tracking and Resolution~~
  - iii. Exhibit Q – SOP - Generating a Procedure for A-Typical Repairs

**Commented [HJ6]:** Combine with As built. As-built procedure to address both as built survey data and attesting statements of compliance regarding post placement curing, protection, strength development / formwork striping compliance data.

**Commented [JT7]:** I would disagree with this method. See JT 4 comment.

- d. Exhibit R – SOP - Opportunities for Improvement Program - Throughout the project, Opportunities for Improvement (OFI) shall be documented using the **Sub-contractor OFI Mobility Application**. All co-workers are expected to report OFIs, while the QM will be the lead. The QM shall review and trend all OFIs. Any OFIs determined to be Non-conforming conditions with proposed “uses as is” or “repair” dispositions shall be reported to the General Contractor in accordance with ~~Exhibit B, Writing RFIs~~. QMP 8.3 Deficiency, Nonconformance Procedure.

**Commented [HJ8]:** Add NCR reporting to RFI procedure. Since we have an OFI process to report and trend quality incidents and this is used to develop and improve practices, we only need to bolt on the mechanism for reporting “uses as is” or repair dispositions to our client. Since we are using RFIs to do this, this requirement can be added to the RFI procedure and there is no need to initiate a second process for NCR generation and tracking.

**10. Project Specific Quality Requirements (also called Appendix B - Project Specific Quality Parameters)**

- a. Exhibit S - Insert job specific requirements that are not addressed in the Sub-contractor Standard Quality Plan and procedural guidance for implementation of those requirements.

**Discussion and possible improvement:**

A Work Method is strongly recommended for complex field processes, as concrete can be. This Subcontractor Quality Plan Template does come close to providing a Work Method, but “HOW” is the missing ingredient. The author has proposed this in section 7 – Pre-installation per WM 1.1.1 Slab on Grade Work Method. Perhaps the WM Template is sufficient.

[John, this document is excellent and if we are successful in getting other subcontractors to take this template and updating for their trade or for their subcontract use, that would be huge.

As well, this will fill in the CONCRETE-specific technical elements that are so far missing in the Quality Plan Template.

John, Thanks for providing this document for ACI 121 use. Jim.]