



**SUBCOMMITTEE ON MATERIALS**  
2016 Annual Meeting – Greenville, SC

**Monday August 1, 2016**

**10:15-11:15 AM EST**

**TECHNICAL SECTION 5C**

**Quality Assurance, Data Evaluation and Acceptance Plans**

**I. Call to Order and Opening Remarks**

- The meeting was called to order at 10:15.
- We will need another vice chair since the current vice chair is with FHWA. Let Curt know if any state would like to be the vice chair

**II. Roll Call**

- Self-introductions were made around the room.
- Technical Section 5b was absorbed by Technical Section 5c. TS5b included “Environmental Quality Measures.” TS5c will need a new name, possibly one more creative than the TS formerly known as 5c.
- TS5c will now have 6 new standards added and each will need a new steward. We need volunteers.

**III. Approval of Technical Section Minutes**

**IV. Old Business**

A. SOM Ballot Items

1. Anticipate updates to R25 by steward Dennis Dvorak, FHWA, to eliminate outdated references
  - This was not completed so we will wait another year. The new time line is September 8 on concurrent ballot or technical section ballot with the idea of adopting for 2017.

B. TS Ballots

- i. Anticipate updates to PP80
  - o MN has revisions, but they did not make it to the TS5c ballot. There were no major changes, but there are improvements.
  - o Motion to move them to concurrent ballot by Maine, seconded by Maryland. No one opposed.
- ii. Anticipate updates to PP81
  - o There are many types of equipment and several manufactures. Is there a need to standardized file formats? George Chang will have a standard format for AASHTO to adopt. Are data file formats even needed by AASHTO? Should it be an AASHTO standard? Should we proceed?
- iii. Consider Provisional for Rolling Density Meter (GPR device)
  - o GSSI has developed a ground penetrating radar (GPR) based system. In the past, three of the exact same devices would not give same results. They must all be measuring from the exact same height to get repeatable results. They are doing additional fine tuning and now getting more consistent results. The device has GPS for location determination.

- The rolling density meter along with PP80 and 81 is for a system to measure 100% of the mix. Look for an extensive webinar hosted by MN about this device. MN may be putting together a standard that may come to a TS5c ballot. Minnesota will take the lead. AASHTO already has a general document on GPR, but there will probably be a standard in the next year for TS5c vote that will bring all three current elements together. These devices provide more information but are not as accurate as cores. Then a fourth document about quality control may be created.

#### C. Task Force Reports

- No task force or research proposals currently for this.

### V. New Business

- Research Proposals
  - 20-7 RPS
  - Full NCHRP RPS
    - a. Optimal Procedures for Validating Contractor Test Data
    - b. Streamlining Construction Quality Assurance on Alternative Delivery Transportation Projects
      - Cecil Jones gave a presentation on NCHRP 20-7, Task 349: Materials Acceptance Plans for Projects Using Alternative Contracting Methods
      - What should the sampling and testing schedule look like for design-build projects? There is a guide document (Proposed Guidelines for Developing a Materials Acceptance Plan for Alternative Contracting Methods) and standard (Proposed AASHTO Standard Practice for Developing Materials Acceptance Plans for Alternative Contracting Methods) available.
      - In this document, there will be information that will provide guidance about what to do if you want to deviate from your usual standards and practices (there are 40+ documented ways that states do things differently). The document includes step-by-step guidance, tables of possible approaches, worksheets to optimize existing situation, and scoring sheets
      - Acknowledges and respects the different ways things are being done by contractors and states
      - Looks at risk level, experience, innovations, use of warranties to quantitatively determine best course of action (i.e., a questionnaire is filled out and answers are assigned points and the sampling technique is determined from the total score)
      - An example was provided on bridge deck rehab with cast-in-place deck using design build.
      - Where will this guide document be stored? Maybe on NCHRP website, but how will it be updated? No ideas about how to actually package this standard and the accompanying documents was provided.
      - How do we identify and reach out to those users beyond materials?
- AMRL/CCRL - Observations from Assessments? N/A
- NCHRP Issues N/A
- Correspondence, calls, meetings – Tech Section 5b assimilation.
- Presentation by Industry/Academia
- Proposed New Standards
  - Cecil Jones, Diversified Engineering “Standard Practice for Developing Materials Acceptance Plans for Alternate Contracting Methods”
  - Waiting for approval from NCHRP to ballot.
- Proposed New Task Forces N/A
- Standards Requiring Reconfirmation N/A
- SOM Ballot Items (including any ASTM changes/equivalencies)

**VI. Open Discussion**

- Research proposals from the TRB Committee on Quality Assurance put forward two proposals. One was selected related to construction regarding cost-benefit analysis of construction.
- There may be an upcoming change to the guidelines that currently allows vice chairs to be from FHWA. The operations guide for each of the subcommittees will be balloted that will prevent FHWA from being vice chairs. If ballot passes, Rick Bradbury (Maine), the current research liaison, could be vice chair, and FHWA could then be the secretary/research liaison.

**VII. Adjourn at 11:10**

- Motion: Maine
- Second: Connecticut

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Dan	Dawood	The Transtec Group, Inc.	dawood@thetranstecgroup.com	717-829-9816	0
Enrico	Stradiotto	Ontario Concrete Pipe Association	enrico.stradiotto@ocpa.com	519-994-0117	0
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# **Materials Acceptance Plans for Projects using ACMs**

**NCHRP 20-07 Task 349**

AASHTO SOM – TS 5c

QA, Data Evaluation and Acceptance Plans

Greenville, South Carolina

August 1, 2016

Cecil Jones, PE

Diversified Engineering Services, Inc.

# Project Team

- Cecil Jones (PI) - Diversified Engineering Services
- Sidney Scott – Hill International
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# Approach

- Literature review and assessment of existing plans
- Survey and analysis
- Interviews with selected agencies
- Develop a framework and details of guidelines
- Provide Guide Document and proposed Standard Practice

# What we learned

- One size fits all not useful
- Acknowledge and respect variations between agencies
  - Risk tolerance
  - Agency and/or Industry experience and expertise
  - Willingness to allow contractor innovation
  - Use of warranties

# Conclusion

- Develop a continuum for the range of possibilities
- Develop a series of steps to assist agencies consider best fit
- Develop worksheets to guide decision making



## Conventional Acceptance

## Alternative Acceptance

### Material Acceptance Plans

- ✓ Agency has primary responsibility for quality (certification, inspection, testing)
- ✓ Materials acceptance risk mostly retained by agency
- ✓ Statistically-based sampling and testing for selected materials to balance buyers and sellers risk

- Reduced agency QA effort based on:
  - Material criticality and risk
  - Quantities (large and small)
  - Use of contractor test data with owner verification
    - Reduced agency verification testing for field-produced materials under control
    - System-wide or regional certification of plant-produced materials
    - Umbrella certifications for materials/product assemblies
    - Reduced levels of inspection for low risk or certified materials

- ✓ Industry has primary (whole-life) responsibility for quality (certification, inspection, testing)
- ✓ Materials acceptance risk mostly transferred to industry
- ✓ Statistically-based sampling and testing for selected materials to balance risk
- ✓ Agency in an audit oversight or stewardship role

DBB

IDIQ

- Advanced or accelerated testing to meet production schedules
- Performance-based testing for long-life and durability
- Greater reliance on industry self-certification
- Acceptance by certification or inspection of materials traditionally accepted by testing

CM/GC

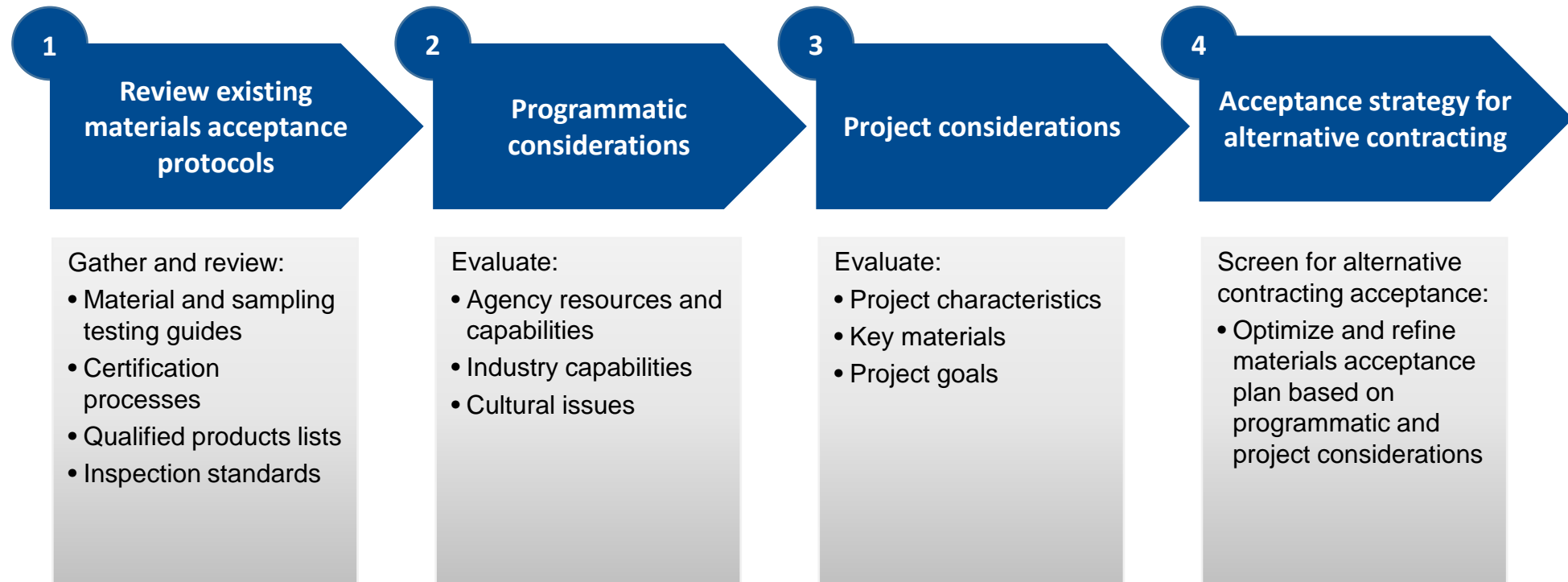
DB

DBOM

# What is included?

- Develop tools to guide decision making
- Tables of possible approaches
- Worksheets to guide the process
- Detailed sample worksheets to aid in clarity

# Steps for Determining Materials Acceptance Plans for a Given ACM



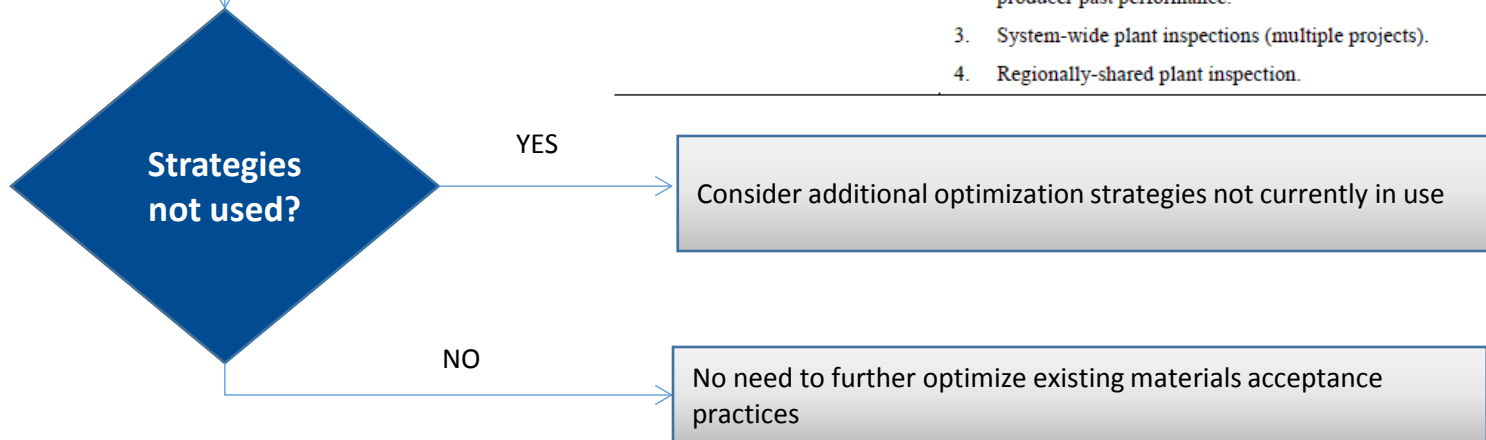
# Optimization Strategies

1 Optimization Strategies

Identify Potential Optimization Strategies in Use:

- Sampling and Testing
- Certification
- Inspection

General Area	General Questions	Yes	No
Sampling and Testing	1. Reduced frequencies for small quantities or large quantities of field-produced materials under control.	<input type="checkbox"/>	<input type="checkbox"/>
	2. Statistically-based sampling and testing using contractor QC data and agency verification testing for acceptance.	<input type="checkbox"/>	<input type="checkbox"/>
	3. Adjustment of sampling and testing frequencies based on material criticality or risk.	<input type="checkbox"/>	<input type="checkbox"/>
	4. Use of performance-based material properties and tests for QC and acceptance.	<input type="checkbox"/>	<input type="checkbox"/>
Certification	1. Certification acceptance of constituent mix properties.	<input type="checkbox"/>	<input type="checkbox"/>
	2. Certification acceptance of small quantities or low risk field-produced materials.	<input type="checkbox"/>	<input type="checkbox"/>
	3. Umbrella Certification of product/material assemblies.	<input type="checkbox"/>	<input type="checkbox"/>
	4. Certification acceptance of qualified materials/products based on qualifications, past performance.	<input type="checkbox"/>	<input type="checkbox"/>
	5. Acceptance of nationally certified materials/products.	<input type="checkbox"/>	<input type="checkbox"/>
Inspection	1. Acceptance by visual inspection for non-critical, low risk field-produced materials.	<input type="checkbox"/>	<input type="checkbox"/>
	2. Levels of plant inspection based on plant certification, producer past performance.	<input type="checkbox"/>	<input type="checkbox"/>
	3. System-wide plant inspections (multiple projects).	<input type="checkbox"/>	<input type="checkbox"/>
	4. Regionally-shared plant inspection.	<input type="checkbox"/>	<input type="checkbox"/>



2

### Programmatic considerations

Evaluate:

- Agency resources and capabilities
- Industry capabilities
- Cultural issues

General Agreement?

YES

- ✓ Agency has resource and experience constraints
- ✓ Industry capable of assuming more responsibility for materials quality assurance activities
- ✓ Agency support for modifying traditional materials acceptance practices

NO

Use conventional agency specified materials acceptance practices

### Topic Area

### General Considerations

Agency resources

1. The Agency faces constraints related to the number of personnel that can be devoted to materials quality assurance activities.
2. The Agency faces constraints related to the experience levels of personnel that can be devoted to materials quality assurance activities.

Industry capabilities

1. Industry is capable of assuming more responsibility for materials quality.
2. The Agency maintains quality or performance records of suppliers.
3. Accredited commercial labs are located in the State.

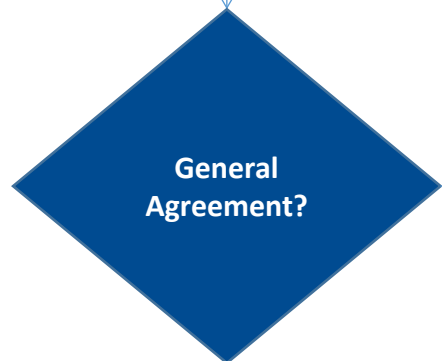
Cultural issues

1. Internal Agency support exists for modifying traditional materials acceptance practices.
2. Agency personnel are willing to relinquish some control in exchange for the contractor accepting more performance risk.

**3a**  
**Project considerations**

Evaluate:

- Project characteristics
- Key materials



YES

✓ A modified materials acceptance plan aligns with given project characteristics  
 ✓ Key materials would lend themselves to modified or reduced agency testing or increased certification by industry

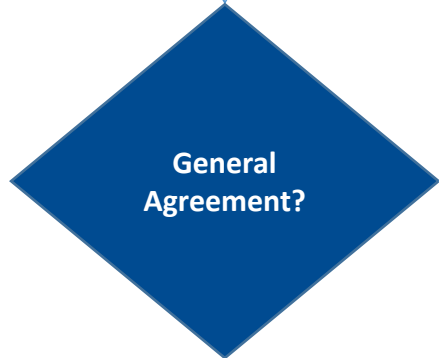
NO

Use conventional agency materials acceptance practices

Topic Area	General Considerations
Project size and complexity	<ol style="list-style-type: none"> <li>1. Materials quality presents minimal risk to the Agency given the nature of the project (e.g., small size, low AADT, routine materials and construction, State vs. Federal funding, etc.).</li> <li>2. Agency resources and/or expertise are inadequate to oversee construction given the large size and/or complexity of the project.</li> <li>3. The work can be specified and accepted using end result or specifications.</li> <li>4. Third-party issues are not expected to introduce quality-related concerns</li> </ol>
Key materials	<ol style="list-style-type: none"> <li>1. Project materials are relatively low risk or non-critical from the perspective of difficulty to repair or replace, safety, cost of rework, or future maintenance costs.</li> <li>2. Materials are produced under generally controlled conditions and are expected to have less variability in properties.</li> <li>3. Several non-local or out-state materials sources will be used.</li> <li>4. The work can be accepted using end result specifications.</li> </ol>

**3b** Project considerations

Evaluate:  
 • Project goals



YES

✓ A modified or accelerated materials acceptance plan most advantageous to support project goals  
 ✓ Performance specs with a focus on innovation and longevity would require more advanced testing and enhanced materials quality management by industry

NO

Use conventional agency materials acceptance practices

Goals	General Considerations
<input type="checkbox"/> Schedule compression	1. The fast-paced nature of construction may strain the ability of Agency resources to provide full oversight. 2. Full Agency oversight may disrupt production. 3. Advanced or non-traditional testing methods could help accelerate production. 4. The contractor is <u>not</u> expected to compromise quality as a means to meet schedule objectives.
<input type="checkbox"/> Cost savings	1. The contractor is <u>not</u> expected to compromise quality as a means to meet budget or profit objectives
<input type="checkbox"/> Innovation	1. Specialized expertise (or a non-traditional acceptance protocol) is required to evaluate quality. 2. The Agency cannot predefine materials acceptance parameters as part of the initial scoping and procurement process.
<input type="checkbox"/> Longevity or durability	1. Performance specifications are being used to establish requirements. 2. The project contains a warranty or post-construction maintenance period that will be used to monitor distresses over time. 3. QA data will be used to support PMS?

# Detailed Worksheets

## ➤ Programmatic Criteria

- Agency Resources
- Industry Capabilities
- Cultural Issues

## ➤ Project-Level Considerations

- Project Characteristics
- Key Materials

## ➤ Impact of Project Goals

- Schedule compression
- Cost savings

## ➤ Impact of Project Goals

- Schedule compression
- Cost savings
- Innovation
- Durability/Longevity

## ➤ Scoring sheet

- Maintain existing protocol
- Shift more QA to industry
- Use non-traditional techniques



# Example 1

- Bridge Deck Rehab, CIP deck, Design-Build
- Step 1: Review existing acceptance program
  - Agency uses contractor data in acceptance decision
  - RE has discretion to reduce agency testing for low risk materials or materials under control
  - Specs allow reduction of testing frequency for small quantities or for large quantities under control

# Example 1

- Step 2: Programmatic Considerations (Worksheet 1)
  - Agency has restraints in resources devoted to QA
  - Industry capable of assuming responsibility for materials QA
  - Agency not willing to relinquish responsibility for materials quality and performance to industry

# Example 1

- Step 3a: Project Characteristics (Worksheet 2)
  - High dollar, high value, urban project
  - CIP deck materials higher risk, critical to safety
  - Agency seeking innovation
- Step 3b: Project Goals (Worksheet 3)
  - Accelerated construction, long lasting deck & use of innovation and non-standard tests for durability encouraged

# Worksheet 1

Programmatic Criteria	Shift more responsibility to industry	Use non-traditional acceptance techniques
<b><i>Agency Resources</i></b>		
1a) Does the Agency face any program-wide constraints related to the number of personnel that can be devoted to materials quality assurance activities? <ul style="list-style-type: none"> <li><input type="checkbox"/> A. Adequate QA resources</li> <li><input type="checkbox"/> B. Limited resources</li> <li><input type="checkbox"/> C. Inadequate resources</li> </ul>	1a) <u>5</u> A. 0 pts B. 5pts C. 10 pts	1a) <u>0</u> A. 0 pts B. 0 pts C. 0 pts
1b) Does the Agency face any program-wide constraints related to the experience level of its materials QA personnel? <ul style="list-style-type: none"> <li><input type="checkbox"/> A. Adequate expertise</li> <li><input type="checkbox"/> B. Limited expertise</li> <li><input type="checkbox"/> C. Inadequate expertise</li> </ul>	1b) <u>0</u> A. 0 pts B. 5pts C. 10 pts	1b) <u>2</u> A. 2 pts B. 1 pts C. 0 pts

## Industry Capabilities

1c) Is industry capable of assuming responsibility for materials QA?

- A. Industry has limited to no experience with materials QA and/or performance to date has been marginal to poor
- B. Industry has some experience with performing QA activities and performance has been adequate
- C. Industry has the qualifications and expertise to develop and implement quality management plans, perform quality assurance, provide certified materials, etc.

1c) 10

A. 0 pts

B. 5pts

C. 10 pts

1c) 0

A. 0 pts

B. 0 pts

C. 0 pts

1d) Are accredited commercial labs located in-State?

- A. Few accredited commercial labs
- B. Some accredited commercial labs
- C. Accredited commercial labs are located in-State and are responsive to fast turnaround needs

1d) 0

A. 0 pts

B. 1 pts

C. 2 pts

1d) 0

A. 0 pts

B. 0 pts

C. 0 pts

***Cultural Issues***

1e) Is there internal Agency support for modifying traditional materials QA practices?

- A. Staff are resistant to modifying traditional methods
- B. Staff are generally tolerant of modifying traditional methods
- C. Active support exists for using non-traditional methods in the interest of meeting accelerated schedules and/or obtaining more performance-oriented results

1e) 2

A. 0 pts

B. 2 pts

C. 2 pts

1e) 5

A. No-Go

B. 5 pts

C. 10 pts

1f) Are Agency personnel willing to transfer more QA responsibility to industry?

- A. Staff are distrustful of industry and unwilling to relinquish control of any quality-related functions
- B. Staff have expressed some openness to the idea of expanding industry's role in quality management
- C. Staff see the advantages of, or need for, greater industry involvement in quality management

1f) No-Go

A. No-Go

B. 5 pts

C. 10 pts

1f) 0

A. 0 pts

B. 0 pts

C. 0 pts

***Programmatic Criteria Subtotal (Questions 1a – 1f)***

*Stop considering this option*

Score No-Go

Score 7/12

# Worksheet 2

Project-Level Criteria	Shift more responsibility to industry	Use non-traditional acceptance techniques
<b><i>Project Characteristics</i></b>		
2a) What is the size/complexity of the project? <ul style="list-style-type: none"> <li><input type="checkbox"/> A. Large, high volume, urban and/or Federally-funded project</li> <li><input type="checkbox"/> B. Medium size project with some complexity</li> <li><input type="checkbox"/> C. Small, simple and/or relatively routine project</li> </ul>	2a) _____ A. 0 pts B. 5pts C. 10 pts	2a) <u>5</u> A. 10 pts B. 5 pts C. 0 pts
2b) Does the Agency have sufficient staff to provide full oversight? <ul style="list-style-type: none"> <li><input type="checkbox"/> A. Resources are available</li> <li><input type="checkbox"/> B. Full-time oversight could strain staff resources</li> <li><input type="checkbox"/> C. Resources are unavailable</li> </ul>	2b) _____ A. 0 pts B. 5pts C. 10 pts	2b) <u>0</u> A. 0 pts B. 0 pts C. 0 pts
2c) Does the project present third-party issues or constraints that would complicate or increase the risk of materials QA? <ul style="list-style-type: none"> <li><input type="checkbox"/> A. Third party issues could be best managed by the Agency</li> <li><input type="checkbox"/> B. Some third party issues that could be jointly managed by Agency and industry</li> <li><input type="checkbox"/> C. Minimal to no third party issues or those that could be managed by industry</li> </ul>	2c) _____ A. No-Go B. 0pts C. 0 pts	2c) <u>0</u> A. 0 pts B. 0 pts C. 0 pts

**Key Materials**

<p>2d) Does the project include high risk or highly critical materials?</p> <p><input type="checkbox"/> A. Key materials present a high risk of non-conformance and/or will result in a large impact if a nonconformance occurs</p> <p><input type="checkbox"/> B. Materials present moderate risk</p> <p><input type="checkbox"/> C. Materials are relatively low risk or non-critical from the perspective of difficulty to repair or replace, safety, cost of rework, or future maintenance costs</p>	<p>2d) _____</p> <p>A. 0 pts</p> <p>B. 5pts</p> <p>C. 10 pts</p>	<p>2d) <u>10</u></p> <p>A. 10 pts</p> <p>B. 5 pts</p> <p>C. 0 pts</p>
<p>2e) Are key project materials produced under controlled conditions?</p> <p><input type="checkbox"/> A. Key materials are produced directly for a specific project, and require subsequent mixing, compacting, finishing, curing, or other processes for incorporation into the work</p> <p><input type="checkbox"/> B. Material are produced under generally controlled conditions and, assuming proper transporting, handling, and storage practices, will not be subject to alteration</p> <p><input type="checkbox"/> C. Materials are produced under highly controlled conditions and have stable properties</p>	<p>2e) _____</p> <p>A. 0 pts</p> <p>B. 5 pts</p> <p>C. 10 pts</p>	<p>2e) <u>5</u></p> <p>A. 5 pts</p> <p>B. 2 pts</p> <p>C. 0 pts</p>
<p>2f) Will non-local or out-of-state materials be used?</p> <p><input type="checkbox"/> A. No more than typical</p> <p><input type="checkbox"/> B. More than typical</p> <p><input type="checkbox"/> C. Much more than typical</p>	<p>2f) _____</p> <p>A. 0 pts</p> <p>B. 2 pts</p> <p>C. 5 pts</p>	<p>2e) <u>0</u></p> <p>A. 0 pts</p> <p>B. 0 pts</p> <p>C. 0 pts</p>
<p><b>Project-Related Criteria Subtotal (Questions 2a – 2f)</b></p>	<p>Score <u>No-Go</u></p>	<p>Score <u>20/25</u></p>



Goals Criteria	Shift more responsibility to industry	Use non-traditional acceptance techniques
<input checked="" type="checkbox"/> <b>Schedule Compression</b>		
3a) Will the fast-paced nature of construction strain the ability of Agency resources to provide full oversight? <input type="checkbox"/> A. No more than typical <input type="checkbox"/> B. More than typical <input type="checkbox"/> C. Much more than typical	3a) _____ A. 0 pts B. 5pts C. 10 pts	3a) <u>5</u> A. 0 pts B. 2 pts <input checked="" type="checkbox"/> C. 5 pts
3b) Could full Agency oversight disrupt production? <input type="checkbox"/> A. No more than typical <input type="checkbox"/> B. More than typical <input type="checkbox"/> C. Much more than typical	3b) _____ A. 0 pts B. 5pts C. 10 pts	3b) <u>0</u> <input checked="" type="checkbox"/> A. 0 pts B. 2 pts C. 5 pts
3c) Could quality be compromised as a means to meet schedule objectives? <input type="checkbox"/> A. No more than typical <input type="checkbox"/> B. More than typical <input type="checkbox"/> C. Much more than typical	3c) _____ A. 0 pts B. 0 pts C. No-Go	3c) <u>0</u> <input checked="" type="checkbox"/> A. 0 pts B. 2 pts C. 5 pts
<input type="checkbox"/> <b>Cost Savings (Build to Budget)</b>		
3d) Could quality be compromised to meet budget or profit objectives? <input type="checkbox"/> A. No more than typical <input type="checkbox"/> B. More than typical <input type="checkbox"/> C. Much more than typical	3d) _____ A. 0 pts B. 0 pts C. No-Go	3d) _____ A. 0 pts B. 2 pts C. 5 pts

**Innovation**

<p>3e) Is specialized expertise (or a non-traditional acceptance protocol) required to evaluate quality?</p> <p><input type="checkbox"/> A. No more than typical</p> <p><input type="checkbox"/> B. More than typical</p> <p><input type="checkbox"/> C. Much more than typical (industry is in a better position to evaluate quality)</p>	<p>3e) _____</p> <p>A. 0 pts</p> <p>B. 2 pts</p> <p>C. 5 pts</p>	<p>3e) <u>0</u></p> <p>A. 0 pts</p> <p>B. 2 pts</p> <p>C. 5 pts</p>
<p>3f) Will the project scope allow for innovation (e.g., alternate designs)?</p> <p><input type="checkbox"/> A. No more than typical</p> <p><input type="checkbox"/> B. Yes, but acceptance parameters can still be defined by the Agency at bid</p> <p><input type="checkbox"/> C. Yes and given extent of innovation sought, the Agency cannot predefine materials acceptance parameters as part of the initial scoping and procurement process</p>	<p>3f) _____</p> <p>A. 0 pts</p> <p>B. 0 pts</p> <p>C. 5 pts</p>	<p>3f) <u>5</u></p> <p>A. 0 pts</p> <p>B. 0 pts</p> <p>C. 5 pts</p>

**Durability/Longevity**

<p>3g) Can the work be accepted based on end-result/performance requirements?</p> <p><input type="checkbox"/> A. Materials accepted based on prescriptive specifications</p> <p><input type="checkbox"/> B. Materials accepted based on a combination of prescriptive and performance specifications</p> <p><input type="checkbox"/> C. Materials accepted based on performance-oriented properties</p>	<p>3g) _____</p> <p>A. 0 pts</p> <p>B. 2 pts</p> <p>C. 5 pts</p>	<p>3g) <u>10</u></p> <p>A. 0 pts</p> <p>B. 5 pts</p> <p>C. 10 pts</p>
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3h) Does the work include a warranty or post-construction maintenance period?

- A. No
- B. Limited to short-term materials and workmanship
- C. Performance warranty or long-term maintenance obligations

3h) ~~\_\_\_\_\_~~  
~~A. 0 pts~~  
~~B. 5 pts~~  
~~C. 10 pts~~

3h) 0  
A. 0 pts  
B. 0 pts  
C. 5 pts

**Goals Criteria Subtotal (answer questions based on applicable project goals))**

**Score No-Go**

**Score 20/40**

	Shift more QA responsibility to industry		Use non-traditional acceptance techniques	
	Scored Points	Maximum Possible Points	Scored Points	Maximum Possible Points
Programmatic Considerations (Worksheet 1)	No-Go	44	7	12
Project-Level Considerations (Worksheet 2)  <b>Final Recommendations</b>	-	45	20	25
Project Goals (Worksheet 3)	-	-	20	40
<b>Total Score</b>	No-Go		47	77
<b>Percentage</b> (Score/Maximum Possible Points)			61%	

Strategy	Comments
Maintain Standard Protocol	
Shift more QA responsibility to industry	
✓ Use non-traditional acceptance techniques	<p>Consider using non-standard acceptance techniques (e.g., permeability/resistivity, concrete cover depth, etc.) that would provide a better indication of long-term durability.</p> <p>Also consider accelerated testing techniques such as use of the maturity method to open the deck early.</p>

# Results of Example

- Agency retains QA responsibility
- Agency considers changing acceptance criteria (Performance based?)
- Agency considers accelerated testing techniques (Maturity?)

# Many options exist

- Outlined in literature review, survey and interviews
- Proposed practice provides tools to assess opportunities to optimize
- Not a one size fits all solution
- Process applies to project by project application as well as program wide

# Design-Bid-Build

- Agency retains responsibility for testing, certification, & inspection.
- Potential optimization of agency QA effort:
  - Testing:
    - Use of contractor QC tests for acceptance
    - Reduced agency verification testing for less critical materials
    - Reduced testing for small quantities, large quantities under control, or low risk materials
  - Certification
    - Qualified products and sources, small quantities or low risk materials
    - Umbrella certification
    - System-wide/Regional certification (plant-produced materials)
  - Inspection
    - Acceptance by visual inspection for small quantities or low risk
    - Levels of inspection based on material criticality



# Design-Build

- Use same optimization strategies as for DBB, but in the interest of fast-tracking and/or shifting more performance risk to industry, consider:
  - Requiring submission of a contractor quality management plan
  - Using performance-oriented materials acceptance parameters as a better predictor of performance
  - Using advanced non-destructive testing for accelerated production
  - Using certification or inspection in lieu of testing for low risk or small quantities

If Using:

Design-Bid-Build

CM/GC

ID/IQ

Design-Build

Design-Build-Operate-Maintain

Alternative Acceptance Strategies

Agency retains responsibility for testing, certification, & inspection.  
Potential optimization of agency QA effort:

Testing:

- Use of contractor QC tests for acceptance
- Reduced agency verification testing for less critical materials
- Reduced testing for small quantities, large quantities under control, or low risk materials

Certification

- Qualified products and sources, small quantities or low risk materials
- Umbrella certification
- System-wide/Regional certification (plant-produced materials)

Inspection

- Acceptance by visual inspection for small quantities or low risk
- Levels of inspection based on material criticality

Use same optimization strategies as for DBB, but due to fast-tracking, consider:

- Using more advanced or non-destructive testing to accommodate accelerated production
- Accepting by certification or visual inspection for lower risk field-produced materials backed by periodic testing

Use same optimization strategies as for DBB, but for very simple or routine projects, consider :

- Pre-qualified sources, standardized materials, and small quantities
- Accepting by certification or visual inspection for standardized items and small quantities backed by periodic sampling and testing

Use same optimization strategies as for DBB, but in the interest of fast-tracking and/or shifting more performance risk to industry, consider:

- Requiring submission of a contractor quality management plan
- Using performance-oriented materials acceptance parameters as a better predictor of performance
- Using advanced non-destructive testing for accelerated production
- Using certification or inspection in lieu of testing for low risk or small quantities

Industry assumes full responsibility for design, construction quality, and long-term performance

- Contractor defines and executes construction quality management and O&M plans
- Performance-oriented materials acceptance parameters for improved long-term performance
- Agency oversight audits during construction
- Agency/Industry joint inspections/monitoring during post-construction period

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Proposed Standard Practice for Developing  
Materials Acceptance Plans for Alternative  
Contracting Methods

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**AASHTO Designation: R XX-15**



**American Association of State Highway and Transportation Officials**  
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# GUIDELINES FOR DEVELOPING A MATERIALS ACCEPTANCE PLAN FOR ALTERNATIVE CONTRACTING METHODS

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DELIVERABLE OF  
NCHRP PROJECT 20-07 TASK 349

LIMITED USE DOCUMENT

This Interim Report is furnished only for review by members of the NCHRP project panel and is regarded as fully privileged. Dissemination of information included herein must be approved by the NCHRP.

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# Next steps

- Subcommittee on Materials feedback
- Subcommittee on Materials consideration
- Workshops or training sessions?

**Thank You!**