Masonry Inspection Checklist

Prepared by the
TMS Construction Practices Committee

Longmont, CO

Masonry Inspection Checklist

Prepared by the
TMS Construction Practices Committee

Longmont, CO
www.masonrysociety.org

PREFACE

The Construction Practices Committee of The Masonry Society has prepared this checklist for use during the preconstruction, construction, and closeout phases of a project. The checklist may be used in whole or in part to aid all members of the project team in performing their duties. The completed document may become part of the job records for that project.

The Masonry Society (TMS) appreciates suggestions for improving the checklist. Comments may be submitted by mail to TMS, 105 S. Sunset Street, Ste. Q, Longmont, CO 80501-6172, by fax at 303-541-9215, or by e-mail at info@masonrysociety.org.

Construction Practices Committee

Chairman
Jonathon R. Merk

Voting Members

Sharath C. Babu
James A. Farny
Robert C. Haukohl
Gregory R. Hess
Rochelle C. Jaffe
Pamela C. Jergenson
Peter J. Loughney
Mel Oller
Jerry M. Painter
Matthew T. Reiter

Corresponding and Consulting Members

John Chrysler (CN)
Charles B. Clark (C)
Richard B. Crooks (C)
Leroy Danforth (C)
Matthew C. Farmer (C)
Rashod R. Johnson (C)
Richard H. Lauber (C)
William C. McEwen (C)
Donald G. McMican (C)
William R. Nash (C)
J. Eric Peterson (C)
Mark Swanson (C)
John E. Swink (C)

ISBN# 978-1-929081-57-8
TMS Order No. TMS-5201-18

Masonry Inspection Checklist

TABLE OF CONTENTS

INTRODUCTION

This document serves as a tool for masonry construction inspectors, mason contractors, general contractors, architects, and engineers to assist them in assuring compliance with the applicable building code and contract documents. Only those items that relate to masonry construction are included. Items that should be checked are listed without explanation. Not all items will be used on every project, and some projects may use items not listed in this Checklist.

The Checklist is divided into four parts:

I. Design and Preconstruction
II. Preparation for Installation of Masonry
III. Masonry Construction QC and Inspection
IV. Closeout

This document is intended to assist in developing a quality assurance program for masonry construction and does not supersede building code or contract requirements. The design professional should determine which items in the Checklist are appropriate for the project and include the approved checklist in the bid documents as part of the QA program.

This edition of the Checklist is based upon the 2016 version of TMS 402 / 602.

INSPECTION ITEMS

I. Design and Preconstruction

A. Contract Documents

1. Specifications (Some of the following information also may be shown on the drawings. Information should be consistent in both locations.)

a.) Name and date of building code and its supplements
b.) References to standards
c.) Specified f'_m for each type of masonry and use (when applicable)
d.) Submittal requirements
e.) Testing and inspection requirements
  i.) Identify level(s) from governing building code or TMS 602 Quality Assurance Tables
  ii.) Review QA plan
f.) Masonry Units
  i.) Nominal dimensions and ASTM standards
  ii.) Color(s) and texture(s)
  iii.) Density (if applicable)
  iv.) Compressive strength
  v.) Special shape(s)
  vi.) Water repellents, admixtures, and other coatings
g.) Natural stone
  i.) Type(s) and ASTM standards
  ii.) Color(s) and texture(s)
  iii.) Dimensions and tolerances
h.) Mortar
  i.) Type(s) / proportions or properties
    - Location for each type
  ii.) Admixtures
  iii.) Pigments
  iv.) Mixing procedures
i.) Grout
  i.) Fine / coarse for conventional grout and slump
  ii.) Fine / coarse for self-consolidating grout
  iii.) Compressive strength
  iv.) Admixtures
j.) Masonry reinforcement, masonry ties, veneer anchors, misc. anchors
  i.) General size requirements, types, spacing, and locations for each type
  ii.) Corrosion protection
  iii.) Lateral restraints, anchorages, and tensioning of prestress reinforcement
k.) Unit installation
  i.) Bond pattern(s)
    - Include alignment of head joints and tolerances
  ii.) Mortar joints
    - Full or face shell bedding
    - Size
    - Tooling
  iii.) Grout placement per TMS 602

l.) Insulation
  i.) Type(s)
    - Location for each type
  ii.) Installation requirements
m.) Damproofing, waterproofing, and air / vapor / weather-resistive barriers
  i.) Materials
  ii.) Transition elements for continuity
  iii.) Compatibility with adjacent materials
n.) Flashing, flashing accessories, and weeps
  i.) Materials
  ii.) Specified installation procedures / manufacturer's installation instructions
  iii.) Locations
  iv.) Compatibility with adjacent materials
  v.) Weep spacing
o.) Post-applied water repellent (if applicable)
p.) Movement joint accessories
q.) Cleaning procedures
r.) Masonry construction tolerances, if more stringent than TMS 602

2. Drawings (Some of the following information also may be shown in the specifications. Information should be consistent in both locations.)
a.) Name and date of building code and its supplements
b.) Specified f'_m for each type of masonry and use
c.) Plans, elevations, sections, details
d.) Masonry units
  i.) Size & wall location
  ii.) Locations for each specified type, color, and texture
e.) Location, type, and size of movement joints
f.) Masonry reinforcement
  i.) Size
  ii.) Type
  iii.) Spacing
  iv.) Splice lengths
  v.) Splice locations if indicated by A/E
g.) Veneer anchors, masonry ties, misc. anchors
  i.) Size
  ii.) Spacing / location
h.) Insulation
  i.) Size
  ii.) Type
  iii.) Location
i.) Damproofing, waterproofing, and air / vapor / weather resistive barriers
  i.) Location
  ii.) Transition details
j.) Flashing, flashing accessories, weeps
  i.) Locations / details
  ii.) Accessories
  iii.) Weep spacing

k.) Lintels
i.) Type
ii.) Size(s)
iii.) Location(s)
iv.) Minimum bearing length
l.) Relief / shelf angles
i.) Size(s)
ii.) Location(s)
iii.) Install to masonry tolerances per TMS 602
m.) Misc. movement accommodation / control details
3. Changes
a.) Approved alternates
b.) Addenda
4. Scope of Work Definition(s)
5. Wall Bracing

B. Submittal and Mockup / Sample Panel Requirements
1. Submittals
a.) Product data / material certificates / mix designs and shop drawings
2. Mockup / Sample Panel
a.) List of materials
b.) Size, quantity, and location(s)
c.) Detail(s) for special condition(s) to exhibit
d.) Aspects to be judged and acceptance criteria

C. Contract Administration
1. Meetings
a.) Required meetings & agenda
b.) Attendance
c.) Minutes and distribution
2. General Project Requirements
a.) Construction start date
b.) Daily work hours
c.) Overtime hours
d.) Inspections, tests, and other quality assurance requirements
e.) Inclement weather conditions / procedures
f.) Substantial completion / Non-conformance procedures
g.) Final completion & warranties

II. Preparation for Installation of Masonry

A. Preconstruction Conference
1. Owner, A/E, G.C. / C.M., Mason, Inspection Agency, Testing Agency, Suppliers as necessary – minimum recommendation of A/E, G.C. / C.M., Mason, & Inspection Agency
2. Review Construction Documents
3. Review Design Team reviewed Submittals & Shop Drawings
4. Review Specified Penetration Details
a.) Through interior wythe or framing / sheathing
b.) Through damproofing, waterproofing, or air / vapor / weather-resistive barrier
c.) Through cavity insulation
d.) Through exterior wythe
5. Review Inspection & Testing Requirements

6. Review Non-Conformance Resolution Procedures
   a.) Reporting / documentation requirements of specific discrepancy and location
   b.) Reviewer responsibility
   c.) Re-work / repair and reporting / documentation requirements

B. Review of Mockup / Sample Panel and Cleaning Process
   1. Materials
      a.) Are all specified mockup materials included
      b.) Do materials generally conform to project specifications and reviewed submittals
   2. Craftsmanship (see section III.B)
   3. Cleaning procedures
      a.) Effectiveness and compatibility with masonry and adjacent / nearby materials
      b.) Protection of non-masonry materials when appropriate
   4. Testing

C. Materials / Material Storage
   1. Covered / Protected from Weather
   2. Material Set on Pallets / Dunnage to Prevent Contact with Earth
   3. Material Submittals and Samples vs. Delivered Materials
      a.) Delivered product vs. specifications, referenced standards, and submittals
      b.) Notifications for discrepancy
      c.) Removal of rejected materials from jobsite

D. Substrate Review
   1. Clean and within moisture limits
   2. Foundation and masonry ledge within masonry tolerances
   3. Cast-in-place foundation dowels and prestressing tendon anchorages
      a.) Size, spacing, and position
      b.) Installation within tolerances
   4. Backup for veneer (masonry, concrete, wood or steel framing) within tolerances
   5. Structural steel and structural concrete
      a.) Vertical members within tolerances
      b.) Horizontal members within tolerances
      c.) Relief / shelf angles within masonry tolerances
   6. Damproofing, waterproofing, and air / vapor / weather resistive barrier installation
      a.) Commissioning agent / design team verify installation is of appropriate thickness
      b.) Laps and transitions
      c.) Sheathing fasteners fully sealed
      d.) Seal around veneer anchors and joint reinforcement pintles
   7. Review Penetration As-Built Conditions
      a.) Through interior wythe or framing / sheathing
      b.) Through damproofing, waterproofing, or air / vapor / weather-resistive barrier
      c.) Through cavity insulation
      d.) Through exterior wythe

III. Masonry Construction QC and Inspection

A. Review Approved Changes

B. Craftsmanship / Installation
   1. Unit installation observation
      a.) Color(s) and texture(s) in proper location
      b.) Completeness of mortar joint
      c.) Tooling of mortar joint
      d.) Verify conformance with approved mockup

2. Mortar
   a.) Batching (for non-prepackaged mortar)
   b.) Mixing operation
   c.) Installation per TMS 602
3. Grout
   a.) Batching (for non-prepackaged grout)
   b.) Mixing operation (for non-ready mix product)
   c.) Installation per TMS 602
4. Reinforcing Steel
   a.) Field bends (prior to installation) / hooks / modifications
5. Grout and Reinforcing Steel Placement
   a.) Placement of reinforcing steel
      i.) Size and grade
      ii.) Spacing
      iii.) Location in cell / bond beam
      iv.) Lap splices / connectors
   b.) Grout placement
      i.) Verify grout space dimensions
      ii.) Verify lift / pour height
         - Verify cleanout requirements (where applicable)
      iii.) Check slump and temperature for conventional grout; check slump flow, temperature, and Visual Stability Index for self-consolidating grout
      iv.) Verify consolidation and reconsolidation for conventional grout
6. Joint reinforcement
   a.) Size, type, and corrosion protection coating
   b.) Spacing, and placement for mortar cover
   c.) Laps / splices
7. Anchors, ties, and fasteners
   a.) Size
   b.) Type, and corrosion protection coating
   c.) Placement for mortar or grout cover
8. Damproofing, waterproofing, and air / vapor / weather-resistive barriers
   a.) Transitions
   b.) Penetrations
9. Insulation
   a.) Cavity insulation
      i.) Location for size / type
      ii.) Attachment method
      iii.) Joint treatment
   b.) Loose fill insulation
   c.) Expanding / spray foam
10. Cavity size, air gap size, and tolerances
11. Flashings, accessories, and weeps
   a.) Flashing
      i.) Size
      ii.) Location
      iii.) Laps / splices
      iv.) Top and leading edge terminations, corners, and end dams
      v.) Use of primers / mastics / adhesives

b.) Accessories
i.) Cavity mortar dropping control
- Size, location, and spacing for discrete accessories
ii.) Termination Bar
- Type
- Fastener type and spacing
- Mastics / adhesive
iii.) Drip Edge
- Size and type
- Laps
- Mastics / adhesive
c.) Weeps
i.) Size and type
ii.) Spacing and placement

12. Movement joints
a.) Type
b.) Size
c.) Location
d.) Structural requirements (i.e. dowels or shear keys)

13. Wall construction
a.) Wall location and dimensions
b.) Installation tolerances per TMS 602
c.) Masonry openings
i.) Sizes
ii.) Locations
d.) Built-in items
e.) Obtain A/E approval of miscellaneous penetrations not shown on Drawings

14. Cleaning
a.) Dry cleaning mortar residue and droppings
b.) Wet cleaning
i.) Observation of minimum cure time
ii.) Compatibility of cleaning agent with masonry and adjacent / nearby materials
- Check manufacturer's recommendations

15. Prestress work
a.) Verify tendon size, location, anchorage, and lateral restraints
b.) Verify grout proportions for anchorages and bonded tendons
c.) Verification of tendon stress per TMS 602

C. Additional Quality Control Measures

1. Temporary wall protection
a.) Top of wall / cavity covered during construction
b.) Wall bracing (where necessary)

2. Assist Inspection Agency and Testing Agency with field testing
a.) Type and frequency requirements
b.) Observation of specimen preparation / sampling / storage
c.) Review of test results

3. Hot and cold weather provisions

IV. Closeout

A. Closeout Data Manual Requirements

1. List (including suppliers name & address) of all specified materials
2. Clean copy of approved submittals
3. As-built drawings (when required)
4. Warranties

B. Maintenance Recommendations

1. Annual inspections
2. Joint sealant life expectancy
3. Water repellent life expectancy
4. Reference to NCMA Tek Notes series 8
5. Reference to BIA Technical Notes 20, 23, and 46

Exhibit A
DISCREPANCY REPORT

Page _____of_____

Subcontractor/Vendor	Subcontractor Purchase Order No.	Date:	Discrepancy No.

Item: No:	Location:	Specification/Drawing

Description of Discrepancy_____

PROPOSED RESOLUTION_____

_____Rework _____ Repair _____ Scrap _____ Use as is ___Return to Supplier

Report Prepared by	Date	Owner	Date

QC Approval	Date	Owner	Date

COMPLETION OF APPROVED RESOLUTION

Re-inspection / Verification Results:

_____Accept Inspected Contractor QC Manager: _____

_____Reject Inspected (Owner QC): _____

Comments:_____

FINAL ACCEPTANCE

Project Manager: _____ Date: _____

Resident Engineer: Date:

Exhibit B
Discrepancy Resolution Log

Discrepancy No.	Date	Related Report	Date Of Report	Spec Section Drawing No.	Description of Discrepancy	Status/Date (see * below)

*: 1 = Item does not conform.
2 = Correction required/in process.
3 = Discrepancy corrected/resolved

The Masonry Society is a gathering of people interested in the art and science of masonry. It is a professional, technical, and educational association dedicated to the advancement of knowledge on masonry. TMS members are design engineers, architects, builders, researchers, building officials, material suppliers, manufacturers, and others who want to contribute to and benefit from the pool of information on masonry. TMS gathers and disseminates technical information through its committees, publications, codes and standards, slide sets, videotapes, computer software, newsletter, referred journal, educational programs, professors' workshop, scholarships, certification programs, disaster investigation team, conferences, and Annual Meeting.

For more information contact The Masonry Society as noted below.

ISBN# 978-1-929081-57-8
TMS Order No. TMS-5201-18

The Masonry Society
105 S. Sunset Street, Ste. Q
Longmont, CO 80501-6172
Phone: 303-939-9700
Fax: 303-541-9215
E-mail: info@masonrysociety.org