

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Special Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Quality-control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Architect, Owner or Owner's representatives.
- B. Quality-control services are required to verify compliance with requirements specified or indicated, or to verify that portions of the work are functioning as intended.
- C. Quality-control services specified in this section do not limit the Contractor's responsibility to provide quality-control services specified in other sections or portions of the Contract Documents. Specified quality-control services do not limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
- D. This Section includes administrative and procedural requirements for quality-control services not specified in other sections, including the following:
 - 1. Infrared Roof Moisture Survey
 - 2. Alternate Roof Moisture Survey
 - 3. Roof Drain Testing
 - 4. Rooftop Equipment Survey/Testing

1.3 INFRARED ROOF MOISTURE SURVEY

- A. Not sooner than three (3) months and not longer than six (6) months after completion of the roof system, the Contractor shall have an infrared roof moisture survey performed, by an independent testing firm, on all roof areas replaced under this Contract.

B. Qualifications of testing firm:

1. The survey shall be performed by a firm specializing in infrared thermography services for a period of at least ten (10) consecutive years.
2. The survey shall be performed by an NDT test technician certified to at least Level 2 in the Thermal/Infrared test method, in accordance with American Society for Non-destructive Testing Recommended Practice SNT-TC-1A, and having at least five (5) years experience in providing infrared inspection services on commercial roofing systems.
3. The Owner has the right to reject any testing firm which does not meet, or does not provide satisfactory evidence of meeting, the above requirements.
 - 1) In the event the Owner rejects the Contractor's testing firm, it shall be the responsibility of the Contractor to provide another firm acceptable to the Owner, at no additional cost to the Owner.

C. Survey format:

1. The roof moisture survey shall be ground-based, walk-over type, performed and reported in accordance with ASTM C-1153; "Standard Practice for the Location of Wet Insulation in Roofing Systems Using Infrared Imaging", with the following additional requirements:
 - a. The entire survey shall be recorded on VHS videotape with audio descriptions of roof area designations and observations. A copy of the videotape shall be submitted with each required copy of the report.
 - b. The report shall include thermograms of all moisture suspect anomalies, with corresponding daylight photographs of the same areas, taken from the same perspective.

D. Submittals:

1. At least thirty (30) days prior to anticipated performance of the survey, the Contractor shall provide written certification that the proposed testing firm meets the requirements specified in 1.3.B above.
 - a. Certification shall be accompanied by documentation from the testing firm indicating the firm's experience and qualifications, including a list of projects and references for similar testing performed over the last ten (10) years.
 - b. Certification shall be accompanied by documentation of the technician's qualifications, including training,

certification and list of similar testing projects performed over the last five (5) years.

- E. Retesting: The Contractor is responsible for retesting where results of inspections, tests, reports or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements.
- F. Final payment to the Contractor will not be made until the roof moisture survey is complete, including submission of acceptable documentation, and all necessary corrective work is performed to the satisfaction of, and at no additional cost to, the Owner. The Owner will retain the scheduled value of the roof moisture survey and any incomplete work, plus five percent (5%) of all completed work, until final payment. Said retainage shall not limit the costs associated with the roof moisture survey or the extent of corrective work that may be required to remedy any and all subsurface moisture.

1.4 ALTERNATE ROOF MOISTURE SURVEY

- A. If it is the Owner's opinion that an infrared roof moisture survey may not be appropriate or effective in detecting suspected subsurface moisture, the Owner may request a supplemental or alternate method of moisture survey.
- B. The Owner will compensate the Contractor for all moisture survey costs in excess of the infrared roof moisture survey cost. Any subsurface moisture encountered by the supplemental or alternate moisture survey shall be corrected at no cost to the Owner.

1.5 ROOF DRAIN TESTING

- A. Pre-Construction Testing: Prior to the start of any work on the roof, the Contractor shall water-flow test all roof drains, to determine if any full or partial drain clogs exist in the drainage system.
 - 1. The results of the testing shall be reported to the Owner, in writing, prior to the start of work.
 - 2. The Owner will be responsible for correction of any drainage problems reported by the Contractor prior to the start of work.
 - 3. Any drains, piping or other components, whether exposed, concealed, below grade, etc., found to be clogged after the start of construction, and not reported to the Owner prior to the start of construction, shall be cleared, repaired or replaced as required to restore full drainage capacity. All work shall be performed by the Contractor at no addi-

tional cost to the Owner, including patching, repair or replacement of any materials, finishes, landscaping, etc., disturbed in gaining access to drainage components.

- B. Post-Construction Testing: When all work reaches substantial completion, the Contractor shall water-flow test all roof drains, to determine if any full or partial drain clogs exist in the drainage system.
 - 1. Report the results of testing to the Owner in writing prior to preparation of the final punchlist inspection.
 - 2. Any drains, piping or other components, whether exposed, concealed, below grade, etc., found to be clogged shall be cleared, repaired or replaced as required to restore full drainage capacity. All work shall be performed by the Contractor at no additional cost to the Owner, including patching, repair or replacement of any materials, finishes, landscaping, etc., disturbed in gaining access to drainage components.

1.6 ROOFTOP EQUIPMENT SURVEY/TESTING

- A. Prior to the start of any work, the Contractor shall inspect all existing rooftop equipment, including but not limited to the following:
 - 1. Packaged HVAC units, including related ductwork, natural gas piping, power and control wiring/conduit, etc.
 - 2. Exhaust fans and ventilators, including related ductwork, power and control wiring/conduit, etc.
 - 3. Condensing units, including related condensate piping, refrigerant piping, power and control wiring/conduit, etc.
 - 4. Antennas and satellite dishes, including related cable/conduit, etc.
 - 5. Light fixtures, including related power wiring/conduit, photo-control devices, etc.
- B. The Owner will provide personnel, familiar with the building's mechanical systems, to assist the Contractor or Contractor's subcontractor, in the operational verification of existing equipment.
- C. Prior to the start of work, the Contractor shall report any damage, improperly functioning or non-functioning items to the Owner, in writing. Photographic or videotape documentation of damaged items is to be included with the report.
- D. Any damage, improperly functioning or non-functioning rooftop equipment, not reported to the Owner in writing prior to the

start of work, shall be repaired or replaced at no cost to the Owner.

1. Current age, current value and/or original value of existing equipment shall not limit the Contractor's responsibility for cost of necessary repairs or replacement. Repair or replacement of aged equipment shall be non-prorated.
2. Where repair of existing equipment exceeds the cost of replacement with equal or similar equipment acceptable to the Owner, the Contractor may provide replacement equipment.
3. Where damage occurs to equipment or components that cannot be repaired, due to age or availability of components, said equipment shall be replaced with new equipment of similar type and capacity, as approved by the Owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 INFRARED ROOF MOISTURE SURVEY

- A. Notify the Architect and Owner at least seventy-two (72) hours before the anticipated performance of the infrared roof moisture survey.
- B. Confirm that environmental conditions are appropriate for proper performance of the survey and notify the Architect and Owner no later than 1:00pm on the day of the survey to confirm that the survey will or will not proceed as scheduled.
 1. If the survey cannot proceed as anticipated, due to environmental conditions, re-schedule and repeat the above notification requirements as necessary.

3.2 ROOF DRAIN TESTING

- A. Notify the Architect and Owner at least twenty-four (24) hours before the anticipated testing.
- B. Provide 3/4" diameter (min.) hose in sufficient length as required to utilize water source designated by the Owner.
- C. Run water at full volume, for a period not less than twenty (20) minutes, into each drain.
- D. Report any leaking drainage components observed during testing to the Owner.

- E. Re-test after any corrective work and repeat all procedures as necessary until achieving full drainage capacity.

3.3 ROOFTOP EQUIPMENT SURVEY/TESTING

- A. Notify the Architect and Owner at least seventy-two (72) hours before the anticipated survey/testing.
- B. Repair or replace equipment, necessary for building operation, comfort or safety of occupants, immediately upon discovery of improper or non-function.
- C. Repair or replace equipment, not immediately necessary for building operation, comfort or safety of occupants, as soon as practical, but not later than the date of necessary operation as selected by the Owner or project closeout, whichever is sooner.

3.4 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes.
- B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
- C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION 01400