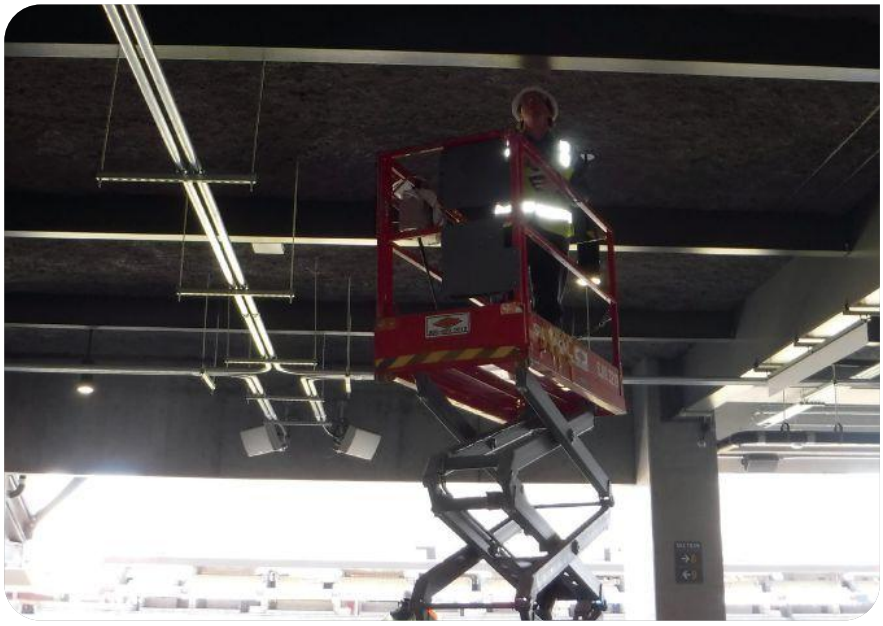
Coating Inspection Documents: Checklists and Daily Report

By ***Mark McCarter, Owner of Southwest Protective Coatings, Inc.***
Photos courtesy of ***the author***

Protective coatings are important for preventing corrosion in virtually all major industry sectors, and coating inspection is critical for quality management to ensure the maximum effectiveness of those protective coatings. As with other types of construction and building inspectors, coating inspectors have a broad range of technical skills and knowledge for performing complex testing and inspection tasks, which need to be formally documented.

Of the many things that construction and building inspectors have in common, one is the requirement to document findings in writing and keep daily logs. There are numerous types of inspection reports that vary in content and format, and each type of document needs to be tailored to the specific task requirements. The "Checklists" and "Daily Inspection Report" covered here are just two of the many reports needed, but they are important, and we will keep them generic in nature for the purposes of this writing.



NACE-certified Coating Inspector-Level 1, Special Inspector-Structural

Inspection Checklists

The origins of the modern checklist date back to October 30, 1935, at Wilbur Wright Field in Dayton, Ohio, when the U.S. Army Air Corps held a competition for airplane manufacturers vying to build the next generation of the long-range bomber. The prototype Boeing B-17 (then known as the Model 299) crashed, killing two of the five crew members. An investigation found that the gust locks had not been disengaged from the cockpit prior to take off. Because the operation of the B-17 was so complex, Boeing determined it was essential for pilots to use a pre-flight checklist.[8]

"Under conditions of complexity, not only are checklists a help, they are required for success."[7] Inspection checklists are widely used for quality control, and some benefits include:

- Standardization of the inspection process;
- Efficient use of time and resources;
- Confidence in the accuracy of inspection results.

The most effective checklists are simple, and they focus on the specific requirements of the inspection tasks. Checklists for standard practices and test methods are useful to ensure formal compliance with the written procedures (Figure 1). Other checklists can be used to delineate shop drawings and submittals, specification requirements, condition surveys, safety procedures, and instrument calibration and operating instructions.

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Checklists for inspection procedures are important because of the variable nature of the information that needs to be documented for

ASTM D7091[1] Checklist

- ☑ Verify the measuring instrument conforms to section 5.3 thru 5.6
- ☑ Check calibration of measuring instrument per section 7.1 (certificate of calibration)
- ☑ Verify accuracy of measuring instrument per section 7.7 (one-point or two-point procedure)
- ☑ Determine the size of the structure to be tested, see section 8.2
- ☑ Determine the frequency for measurements per section 8.2
- ☑ Perform thickness measurements using the determined frequency per section 8.2
- ☑ Verify accuracy of instrument after measurements have been acquired per section 7.7.2
- ☑ Record and report the results per section 9

Figure 1. Example checklist for ASTM Standard Practice for DFT measurement

different types of inspections. Two of the standards that exist for coating inspection are ASTM D3276, "Standard Guide for Painting Inspectors (Metal Substrates)" and ASTM D6237, "Standard Guide for Painting Inspectors (Concrete and Masonry Substrates)." Each standard has an Inspection Checklist in the appendix.

This example is shown for demonstration purposes only, and as you can see, the checklist should be broken into smaller groups for efficient use. Please refer to the official ASTM standard because it contains valuable information not shown here, such as the test methods and equipment needed for each task and useful commentary for each section.

Daily Inspection Report

According to SSPC: The Society for Protective Coatings' Quality Control Forms, "One of the most important responsibilities of a coatings inspector is to document the results of inspections in a clear, concise, and timely manner. Without timely, formal documentation, many of the details of an inspection may be lost or forgotten. Documenting specific, key items as the work progresses essentially tells the story of the project — what work was done on a given day and work shift, what the work conditions were, whether the work met requirements, what non-conforming work was done and how it was repaired, etc."[5]

The scope and volume of data included in the inspection report will vary depending on the size and complexity of the project or task. Most coating inspection reports will be centered around common data elements that create the report content. There are numerous templates available on the internet, and most are generic, but some are designed for specific purposes. In my experience, the most effective reports are customized to the task, contain only data that's pertinent to the project, and are easy to interpret for the reader. I would recommend that you create reports that are also project oriented, meaning there'll be one report created each day for a specific project (hence, daily report) even if multiple inspections are performed for the project. However, some jobs may require individual inspection reports for the same project or task.

The content of a typical inspection report includes technical writing, which will actually be closer to a form than a report. A report typically follows the classic outline of background, history, observations, conclusions, and recommendations, and it is usually used for assessments, summaries, and final reports. (I'll briefly cover forms and reports in the next section.)

As you can see from the above lists, coating inspection can require the acquisition of a considerable amount of data: some of which won't change for a series of reports, some will vary according to the inspection tasks, and some will be unique for each report. There may be some need or desire to use paper forms for documentation, but let's focus a bit on electronic systems for data collection and reporting.

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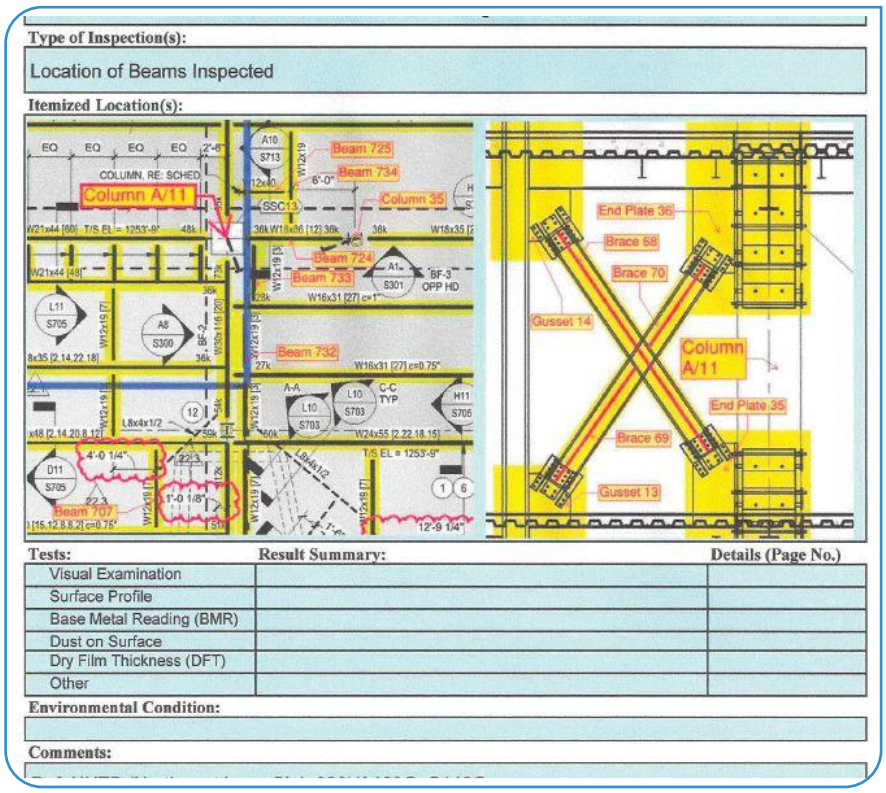
Digital Technology and Data

Data management is a big topic. There are numerous options for documenting inspection activities using both off-line devices and on-line services. A wide range of software applications are available for desktops, laptops, tablets, and smartphones. Test instruments, digital cameras, and



Inspection report excerpt showing location details, Adobe Acrobat

digital voice recorders have software for storing, transferring, renaming, and formatting data for connectivity with software programs used for documentation.

Forms are primarily used for data input, and reports are used for presenting data in a structured and useful format. Forms are designed to be used on screen; reports are designed to be printed or saved as a file. There are many options for creating and using fillable forms for data collection and designing professional-looking reports to convey the information. But the real power, in my opinion, is in storing the data in a database management system (DBMS), which has advantages such as:

- Efficiency of data collection and report generation;
- Consistency and accuracy of the inspection data;
- Data integrity and security for multiuser systems.

The downside is in the complexity of the initial setup. There are template files available for tables, forms, reports, and databases. It's possible to convert existing software files — and even hard copies — to a database; however, extensive customization and some programming skills may be needed to fully implement a functional DBMS. A major feature of a database is the ability to utilize the data for various purposes, including to:

- Create different types of technical reports;
- Analyze data for project management;
- Interface and share data with other management systems.

The learning curve may be steep for those wishing to upgrade from using word processing, spreadsheets, or other file-based applications, but, in my experience, it's worth the effort to understand how a DBMS works. Even a simple implementation of a database can significantly improve the efficiency and accuracy of inspection report management.

One thing that does need to be taken into consideration here is cyber security. Inspection reports, and construction documents in general, can contain confidential information that may not be allowed to be accessed or transmitted using web-based applications or methods. For large projects, the document control procedures are usually covered in the specifications. Some owners or clients may have special requirements for how information is exchanged, which makes it desirable for reporting methods to be flexible in an ever-changing digital environment.

Summary

According to *The Checklist Manifesto*, "It is common to misconceive how checklists function in complex lines of work. They are not comprehensive how-to guides, whether for building a skyscraper or getting a plane out of trouble. They are quick and simple tools aimed to buttress the skills of expert professionals."[7]

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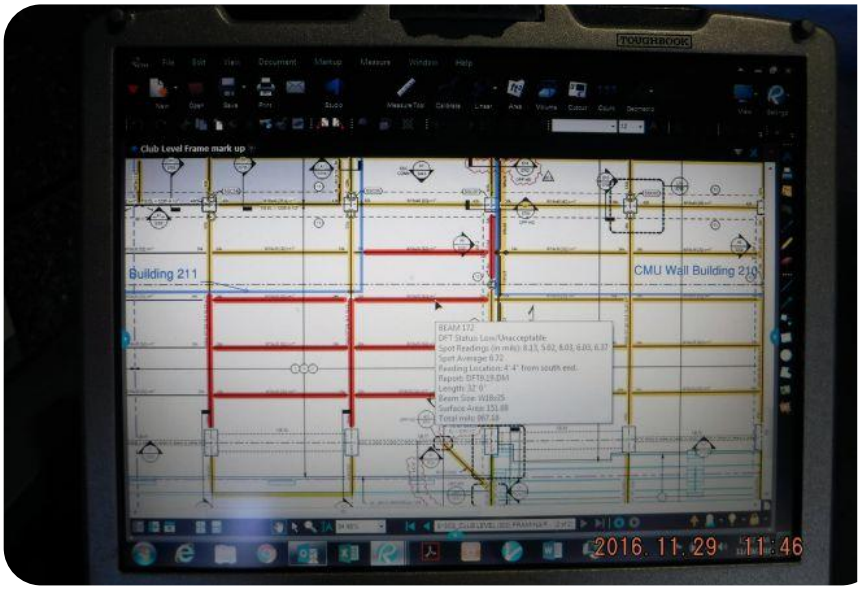

Field service laptop for test locations, Bluebeam Revu software

```
VERSION 1.0 CLASS
BEGIN
  MultiUse = -1  'True
END
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = True
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Option Compare Database
Option Explicit

Dim GrpArrayPage(), GrpArrayPages()
Dim GrpNameCurrent As Variant, GrpNamePrevious As Variant
Dim GrpPage As Integer, GrpPages As Integer

Private Sub PageHeaderSection_Format(Cancel As Integer, FormatCount As Integer)
HeaderRptNum = Me!DateReportNum
HeaderID = Me!Event
HeaderDate = Me!EventDate
HeaderTime = Me!EventTime
HeaderJobDesc = Me!JobDescription
HeaderJob = Me!JobName
Dim i As Integer
  If Me.Pages = 0 Then
    ReDim Preserve GrpArrayPage(Me.Page + 1)
    ReDim Preserve GrpArrayPages(Me.Page + 1)
    GrpNameCurrent = Me!Event
```

VBA code for report automation, Microsoft Access

are a simple and effective tool for documenting inspection work in an efficient manner without overlooking any of the requirements."[5]

Coating inspectors play an important role in the construction industry, and the technical aspects of their work are enhanced by having the skills to present data in clear and concise documents that are readable and useful to the end-user and accurately detail the required information. Thus, using checklists and standardized reports and implementing a management system should increase the quality and accuracy of the inspection process. **CP**

Coating inspectors play an important role in the construction industry.

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Head to www.coatingspromag.com for additional resources.