

**Appendix R.  
Construction Manual**

# **Field Engineering**

# **Inspection Department**

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**FIELD ENGINEERING DEPARTMENT<sup>1</sup>  
CONSTRUCTION INSPECTION**

**MISSION STATEMENT**

Insure that new construction meets District standards, specifications and intent of original design in accordance with contract documents.

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<sup>1</sup> Field Engineering: Construction Inspection

## **STRATEGIC PLAN OBJECTIVES**

1. Support the General Manager/District Strategic Plan objectives.
2. Manage Public Works contracts in a thorough, timely, and cost effective manner.
3. Promote departmental training to include technical and management skills.
4. Incorporate necessary means in department processes to maintain a high standard of payment to contractors.
5. Hold semi-annual status meetings to assess departmental effectiveness.

## **DEPARTMENT GOALS & OBJECTIVES**

1. Continue active participation in AWWA Materials Approval Committee.
2. Work together in partnership enhancing productivity.
3. Make conversion to another district supported software for daily inspection reports.
4. Enhance Executive Summary Reports for monthly progress on CIP projects.
5. Upgrade Construction Management / EXPEDITION to current revision.
6. Participate in local water industry organizations: i.e., ICWA, FATC, APWA, and SOCAL water agency committee.
7. Continue to provide support to all District Branches on technical issues.
8. Increase staff and office space needs to meet projected workload demands.
9. Review of departmental administrative procedures as necessary.
10. Coordinate and refine CFD-AD project processes and schedules.
11. Support CALSTAR Safety Culture with staff participation in meetings, Tech teams, Field, Contractor, and Division audits.
12. Review EMWD Developer/Contractor insurance requirements.

## NARRATIVE

The Field Engineering group is the steward of new construction for water and sewer systems on Public Works and Developer sponsored projects. The Field Engineering Department will continue to strive to maintain a high level of consistency in the daily operation. Interaction with other departments and agencies sharing both management and technical skills will benefit the Public and EMWD with better performance. Continuous self-evaluation and upgrades to current software will allow the Department to be cost effective in our operation and keep us on the cutting edge of the business. Semi-annual reviews of the departmental processes will allow us to focus on the Strategic Plan Goals set forth by the General manager as they relate to the Field Engineering Group.

## **EMWD INSPECTION CAREER DEVELOPMENT PLAN SUMMARY**

The following is a descriptive summary of the general characteristics of the inspection positions.

### **Construction & Safety Inspector I:**

This position is an entry-level position performing a range of duties that involves pipeline inspection in housing developments, and service order connections for both water and sewer. The training period lasts approximately one to two years with an ability to flex to the next position in that time frame. During this period the inspector will learn a complex variety of tasks that include survey skills, record keeping, drafting skills, the ability to analyze and interpret water and sewer facility construction drawings. Organizational skills will be utilized along with improving the ability to communicate with people outside the EMWD organization. Upon completion of training period the inspector can flex into Inspector II position, this is accomplished with the concurrence of the department supervision.

### **Construction & Safety Inspector II:**

This position is achieved once the level I inspector has proven that they are capable of performing the duties described in the classification. Training desired, but not required for this position is as follows; American Concrete Institute (ACI) Field Testing Technician Grade I, (AWWA) Water Distribution Operator Grade I. This position is considered to be a journey level pipeline inspector with the ability to inspect more complex pipeline projects and manage daily reporting and monthly pay estimate calculations. These projects will include larger diameter systems installed under the capital improvements of EMWD. Training can also be started in the smaller District facilities area of inspection. This would include, but not be limited to, small sewer lift stations, small water pumping plants, wells, grading and earthwork projects. A level II inspector is expected to begin learning the required skills to advance to a level III inspector when opportunities are present and the individual inspector has a proven high performance work history and annual performance review.

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Advanced duties of the level III inspector position will include, but not be limited to, welding & coating inspections of structural steel storage facilities and large EMWD structural, mechanical & electrical projects. 5 years experience at a level II inspector workload ( or equal) with a high level of performance and annual reviews to promote to the level III inspector position.

Current certifications for American Concrete Institute Grade I and AWWA Water Distribution Operator Grade I are required for the level III inspector position.

### **Construction & Safety Inspector III:**

This position shall be considered a journey-level position for most construction projects at EMWD. The level III position has the ability to perform all pipeline projects and most of the difficult capital improvement projects with little supervision. These are complex projects that could include all of the workloads an inspector may expect to encounter at the district. Inspector would be able to assist district staff in the decision making process of these projects and many other issues that may arise during construction. This level would assist in training entry-level staff and less experienced inspectors. An advanced level of education and or experience is necessary to perform at this position due to the advanced type of work assigned. A level III inspector is expected to take a leadership role and continue to study and learn the required supervision skills to advance to a senior level inspector position when opportunities are present. The individual inspector must have a proven high performance work history and annual review at the level III inspection position.

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## **Senior Construction & Safety Inspector:**

**(Position description under update.)**

This position shall be considered a lead position assisting the Supervising Inspector providing direction to lower level staff. Incumbents must be experienced in all phases and complexities of district work. This position is distinguished from the Inspector III position by the advanced lead and employee review duties. Ability to make critical decisions with limited supervision on complex large dollar Capital facilities. Training of all lower classes of inspectors is a necessary skill to assist supervisors in development of department capabilities.





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## CONSTRUCTION INSPECTION MANUAL

### Purpose

The Inspection Manual provides EMWD inspectors with a guide to assist them in performing their daily tasks in a consistent and thorough manner.

This manual shall benefit EMWD by ensuring a high standard of construction work throughout the District. The manual directives shall assist engineers and contractors alike with regards to project inspection consistency. All inspections shall be handled utilizing these directives. While the contract specifications and drawings are the source of authority for inspection, this manual to expands, clarifies and describes inspection functions and what is expected of the Inspector.

### Authority

Director of Field Engineering  
Construction Inspection Manager  
Construction Inspection Supervisors

### Inspection Policy

Inspection Department shall provide top level on site and shop inspections for District construction projects. Inspectors are responsible for utilizing these policies as they perform their duties.

The construction inspection process shall confirm that materials, procedures and workmanship used by contractors comply with the contract drawings and specifications. Thorough and timely inspections shall assure that construction activities produce the results specified in the contract documents.

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## Duties

- Provide full time inspection for EMWD Construction projects as required.
- Ensure contractor compliance with plans and specifications.
- Inspectors are charged with the day to day acceptance or rejection of project work.
- Disputes shall be resolved on site immediately or taken to the next higher level (supervisor, manager, director).
- Inspectors shall schedule their daily activities around the contractor. Contractor calls for inspection are the first priority. Prioritize District work first then Developer work.
- Inspector shall review all submittals received from the contractor for specified project. Project specifications, drawings and approved material list shall be used to verify all materials delivered on site.
- Inspector shall enforce contract provisions and reject materials or work that does not conform to contract requirements.
- Complete detailed records are kept of all construction activities, workforce, and equipment on the job. Special attention shall be given to documenting field communication between inspector and contractor.
- Review and become familiar with contract specifications, applicable drawings and approved submittals. Notify project engineer of any potential construction conflicts.
- Ensure you are available to meet all scheduled inspection requests from contractors. Ask for assistance when unable to cover all responsibilities.
- Submit all drawing, submittal, contract errors and omissions to project engineer.
- Verify consistency of survey staking to drawings, cut sheets and engineering survey.
- Utilize proper equipment to verify that construction meets the specification tolerances. cover all responsibilities.<sup>6</sup>

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## Obligations

- Comply with EMWD Mission Statement (Values and Beliefs)
- Represent EMWD in a professional manner.
- Provide thorough and timely inspection ensuring construction activities produce the results specified in contract documents.
- Inspectors shall have a thorough understanding of contract drawings and specifications.
- A consistent standard of inspection shall be practiced among inspectors from site to site and throughout each project.
- Work that does not meet specification requirements shall be brought to the attention of the contractor immediately to allow for prompt corrections.
- **SAFETY** issues shall be addressed immediately for corrections. Safety Violation Forms shall be utilized.
- Keep lines of communication open with all contractors.
- Know the contract and specification requirements of projects you are inspecting.
- Utilize EMWD force on all projects relating to existing facilities.
- Utilize EMWD resources to ensure sound decisions:
  1. Contract documents
  2. Inspection Supervisor
  3. Project Engineer
  4. Contract Administrator
- Avoid interference with contractor's construction methods and practices by using good judgment. These matters may result in financial claims.
- Notify Supervisor if communication problems occur with contractor.
- Be thorough, objective, consistent, and require only what is specified.<sup>7</sup>

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## Communication and Directives

The following points display the level of direction that management requires inspectors to utilize:

- **Do not direct** contractor's method of performing the work. As long as the techniques used are adequate for contract requirement do not direct or interfere.
- Maintain a professional relationship with all contractors, subcontractors and their employees.
- Directives shall be issued only when they are supported by the contract documents.
- Notify contractor when in your opinion, construction methods will result in a product that is unacceptable pursuant to project contract documents.
- All verbal notifications are to be noted in your daily inspection reports. All verbal directives shall be followed up promptly in written form to contractor fails to comply. Copy to inspection report.
- Stop any operation being performed in a manner that is immediate hazard to life, health or property.

**NOTIFY YOUR SUPERVISOR IMMEDIATELY!<sup>8</sup>**

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## Recommendations

When dealing with the contractor keep these principles in mind:

- Communicate directly with the site contractor (owner), superintendent or foreman.
- Avoid directives that could be interpreted as controlling, modifying of contractors work, contract requirements or creating new and additional work unless there has been an approved change order.

## Resources

- District MOU and Ordinance 30.38
- Department and District Standard Operating Procedures (SOP)
- Department and District Job Safety Analysis (JSA)
- Department and District Memos
- Department Inspection Manual

## Reporting

- Keep accurate records of construction activities and inspection.
- Accurately account for any extra time and materials.  
([EN-73.1](#): Daily Record of Extra Work)
- Complete reports daily to ensure accuracy.
- Avoid personal comments in your reports. State only the site events and facts. These records can be used in formal proceedings in the event of disputes or claims.
- Reports shall reflect daily events, circumstances such as weather, contractors on site time and notes of all communications or directives given to contractors or subcontractors. Make **Special Notes** of inclement weather and circumstances that may influence construction and cause possible project delays.<sup>9</sup>

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## INSPECTION REPORTS

The following is an overview of the inspection report requirements for EMWD construction projects. As an EMWD inspector, your daily report shall be used to accurately record the facts pertaining to the construction methods, equipment and workforce. The inspector shall note sequencing of the work, past work follow-ups, special events and specific conversations between yourself and the contractor.

### Information

- Accurately account for time and materials
- Verifies actions or decisions of the inspector, contractor or engineer.
- Establishes job status and project site weather conditions and evidence in legal actions in the event of a claim.
- Clarifies project schedule for progress update.
- Provides back up for project delays.
- Justifies final acceptance of project work.<sup>10</sup>

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<sup>10</sup> Field Engineering: Construction Inspection

## Quality

**All completed daily reports for EMWD are public record. You and your subsequent reports may be subpoenaed.**

Write all daily reports to meet the following criteria:

- Clear, appropriate terms and style. Attach sketches and photos to clearly convey your message.
- Include detailed information regarding the work and activities. Expound on procedures or processes.
- *Be concise.* Use short, simple terms and expressions.
- Reports shall be *consistent*. Items in the same order and manner each day.
- *Accuracy.* Confirm labor and material quantities such as distances, weights, units, quantity, type of equipment, and number of personnel.
- *Timely.* Report problems when they arise and submit reports punctually.
- *Objective.* Be factual and unemotional.
- Reports shall be legible, and written in black ink. If created electronically check proper spelling and punctuation.

### **PROOF READ!**

- Inspection reports to be signed in black ink by the preparer.

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## Commonly used Forms

### [EN-10](#) **Inspector's Test Form for Water and Sewer Systems**

Used to monitor the amount of footage tested, type of pipe or structure, type of test, start and finish time, loss, pass or fail, and any comments or remarks that are associated with the test.

### [EN-11](#) **Approval to Pour Concrete**

Used to approve the pouring of concrete structures, sewer manholes and any other various uses for structural concrete in the construction industry.

### [EN-15](#) **Inspectors Report**

Most commonly use for work done in tracts and developer driven projects. Form used for daily status update for both water and sewer construction.

### [EN-15.2](#) **Contract Inspectors Report**

Commonly used for contract work funded by EMWD. Format allows for Work Force and Equipment counts on a daily basis along with daily status update of project.

### [EN-15.3](#) **Inspectors Report for S.O.s**

Commonly used for documentation of inspections done on service order work for developer projects. Mainly service installations.

### [EN-16a](#) **Contract Completion Report**

Used to issue partial releases, substantial and total completions for EMWD contract projects and developer projects.

EN-26 **Construction Deficiency**

Continuous punch list for inspectors to utilize tracking of deficiencies and notifications by date.

EN-42 **Contractor's Performance Report**

Used to critique contractors performance throughout construction period. To be completed at **Substantial** (EN-16a) for District projects and at **Final** (EN-16a) for developer projects.

Performance report on **Soils Firms** to be completed as soon as backfill testing is completed.

EN-62.a **Construction Punch list (to be printed on triplicate)**

Used to notify contractor and developer of items that require correction prior to acceptance of work performed.

EN-62b **Construction Spec Punch list (to be printed on triplicate)**

Form used to notify contractors on EMWD contract projects of items requiring correction prior to acceptance of the work performed on District Projects.

EN-73.1 **(a-d) Daily Record of Extra Work Worksheet**

Record of daily extra work that may occur on EMWD projects and in some cases developer projects. It is intended to keep track of "hours only" and is not used as an agreement to approve dollar amounts. Accuracy is essential for accounting manpower, hours, equipment and materials used.

EN-77 **Project Construction Completion Notice to Operations Department**

Used to notify Operations department of acceptance of bacteria samples, air testing, and total project acceptance for operations by EMWD forces.<sup>13</sup>

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EN-87 **EMWD Notification of Safety Violation**

Used to advise developer or contractor of a potential unsafe condition at project site.

EN-97 **EMWD Inspectors Report of Contractors Accident**

Used for reporting a contractor's accident, incident or near miss. Notifies EMWD Risk Management of potential claims.

EN-103 **Developer Project Construction Checklist**

Gives developer and contractor a detailed sequence of work progress needed for proper installation, testing and acceptance. Advises the developer of needed project construction scheduling as it relates to water and sewer installations and acceptance.

**Field Engineering  
Standard  
Operating  
Procedures**

