Watershed Restoration
Project Management Training

Chesapeake Bay Trust Watershed Restoration
Project Management Training 201 – A Deeper Dive
April 25, 2019

Chesapeake Bay Trust Large Scale Watershed Restoration Project Management Training 201- A Deeper Dive, Day 1

<table>
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<tr>
<th>Time</th>
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| 8:00AM – 8:45AM | Settle-in, Breakfast & Coffee | Introduction  
Welcome & Course Overview  
Sadie Drescher, Chesapeake Bay Trust |
| 8:45AM – 10:00AM | Module 1 – What is Project Management.  
A recap & open discussion on what defines a successful Project Manager  
Presented by Andrew Birmingham, PE & Jeremy Koser, PE |
| 10:15AM – 12:00PM | Module 2 – Organizational Readiness & Risk Management  
How to honestly assess your organization’s strengths and weaknesses  
Presented by Jeremy Koser, PE & Andrew Birmingham, PE |
| 12:00PM – 1:00PM | Lunch                                                                                               |
| 1:00PM – 3:00PM | Module 3 – Project Design & Construction Management  
Discussions on the PM’s Role throughout the project life cycle  
Presented by Matthew Smith, PE & Safa Esfambolchi, Ph.D, PE, PMP |
| 3:15PM – 4:15PM | Bioretention Field Visit – JMT Campus  
Join us for a tour of the SWM facilities installed around JMT’s campus  
Led by Mike Galvin, PE & Jeremy Koser, PE |
| 4:30PM – 5:00PM | Group Discussion - Q&A  
An open discussion for participants to ask our panel any and all questions they may have from the Day 1 Modules  
Presented by Andrew Birmingham, PE & Matthew Smith, PE |
| 5:30PM – 7:30PM | Happy Hour / Networking  
Following the training sessions, we hope you can join us for happy hour and networking time at a local restaurant |

Additional Information:  
There will be a 15-minute break between each training module.
Mr. Andrew Birmingham, PE

Andrew is a Senior Water Resources Engineer, Vice President and Section Manager for JMT’s York, PA, office. He also serves as Regional Water Resources Lead for JMT’s PA offices including York, Harrisburg, Philadelphia, Pittsburgh, and Allentown. Andrew has more than 15 years of experience developing environmental and engineering studies, designs and reports for various stormwater and watershed restoration projects in the Mid-Atlantic Region including stream and stormwater management water-quality initiatives. Andrew received his Bachelor’s degree in Bioresources Engineering Technology from the University of Delaware and a Master’s degree in Environmental Engineering from Johns Hopkins University. He has also attended advanced Project Management and Leadership Development Training and is a recurring presenter in JMT’s Project Management Training Program, where he trains and mentors future Project Manager’s within JMT’s organization.

Mr. Jeremy Koser, PE

Jeremy is a Senior Water Resources Engineer that leads the Environmental Markets Group and is the corporate-wide Water Resources Practice Leader for JMT. He has nearly 20 years of experience in civil and environmental engineering with special expertise in design and management of watershed restoration projects including stream and wetland restoration and other various green stormwater infrastructure projects. He has primarily worked on projects throughout the Chesapeake Bay Watershed States including Maryland, Pennsylvania, Virginia, Delaware and the District of Columbia. He has participated in technical, project management and leadership training for JMT’s Internal Training Programs as well as for various state and local organizations. Jeremy is a watershed protection advocate and mostly enjoys crabbing, fishing, walking through wetlands and turning over rocks in small streams with his family.

Mr. Matthew Smith, PE

Matthew is a Senior Water Resources Engineer, in JMT’s York, PA, office. He serves as the Lead Technical Water Resources Engineer for several JMT projects located throughout York, Harrisburg, Pittsburgh, Maryland, and Texas. Matthew has more than 13 years of experience developing hydrologic and hydraulic studies, as well as final construction documents and reports for various stormwater and watershed restoration projects throughout the Mid-Atlantic Region. Matthew received his Bachelor’s degree in Civil Engineering from Pennsylvania State University. He has attended multiple Project Management and Leadership Development training seminars and has developed and led several training modules for Stormwater Management and Erosion and Sediment Control permitting and design processes for various state and local agencies throughout Maryland.

Dr. Safa Eslambolchi, Ph.D, PE, PMP

Safa is a licensed Professional Engineer in Maryland and Pennsylvania with more than 13 years of experience in with a diverse set of skills in Construction Engineering and Management, Project Controls, Project Management, Operations Research, and Data Analytics. He is an experienced project manager and has been involved in design/construction/management of several multi-million-dollar projects in municipality facilities, higher education facilities, commercial buildings, and wastewater treatment plant. He has worked on several government projects with clients such as Department of State, Department of Energy, City of Philadelphia, City of Baltimore, and Anne Arundel County. He is proficient in scheduling software programs, Primavera P6 and MS Project. Dr. Eslambolchi has a B.Sc. in Civil Engineering as well as two master’s degrees in Civil Engineering (Civil Infrastructure Management) and Architectural Engineering (Construction Management), and a dual doctorate degree in Energy Engineering and Operations Research from The Pennsylvania State University.
## Chesapeake Bay Trust Large Scale Watershed Restoration Project Management Training 201- A Deeper Dive, Day 2

### April 25, 2019

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<th>Time</th>
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<tr>
<td>8:00AM – 8:30AM</td>
<td>Settle-in, Breakfast &amp; Coffee</td>
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<td>Led by Andrew Birmingham, PE &amp; Matthew Smith, PE</td>
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<td>8:30AM – 10:30AM</td>
<td>Module 4 – Individual Project Permitting</td>
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<td>Guidance on implementing successful permitting techniques</td>
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<td>Presented by Kristin Aiosa, QP &amp; Leyla Lange, QP</td>
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<td>10:45AM – 12:00PM</td>
<td>Module 5 – Bidding and Contracting</td>
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<td>Discussions on successfully implementing projects following design</td>
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<td>Presented by Prad Maraj, PE, PSP, CCM</td>
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<td>12:00PM – 1:00PM</td>
<td>Lunch</td>
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<td>1:00PM – 2:30PM</td>
<td>Small Group Activity – Project Scheduling &amp; PM Controls</td>
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<td>An activity designed to draw on several key aspects covered in the training modules. You will be</td>
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<td>presented with a sample project and be asked to develop a project schedule and determine</td>
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<td>critical project management-related items. Work will be performed in small groups, with brief</td>
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<td>presentation and discussion with the class and facilitators.</td>
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<td>Green Stormwater Infrastructure (GSI) – Stormwater Retrofit Project</td>
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<td>2:45PM – 3:45PM</td>
<td>Module 6 – Liability, Insurance &amp; Bonds</td>
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<td>An overview of what your organization needs to know about the legal aspects of the contractual</td>
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<td>Presented by Jim Morris, PE &amp; Matthew Smith, PE</td>
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<td>4:00PM – 5:00PM</td>
<td>Training Recap - Q&amp;A</td>
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<td>Open Panel Discussion - All Facilitators</td>
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### Additional Information:
There will be a 15-minute break between each training module.
Ms. Kristin Aiosa, QP

Kristin is a Senior Environmental Scientist for JMT’s York, PA, office. She also serves as the Regional Natural Resources Lead for JMT’s DE offices including Newark and Dover. Kristin has more than 20 years of experience in environmental science in the Mid-Atlantic Region, including NEPA, environmental resource permitting, development of sustainable and resilient solutions, environmental compliance, environmental field investigations, resource impact assessment, and avoidance/minimization/mitigation analysis. Kristin received a Bachelor of Arts in Environmental Studies, a Bachelor of Science in Geology, and her Master’s degree in Geography, Physical Environmental Systems from the University of Binghamton. She has also attended Project Management Training and is registered as a MD DNR Forest Conservation Qualified Professional and certified as an MDE Responsible Personnel for erosion and sediment control.

Ms. Leyla Lange, QP

Leyla has more than 25 years of experience and is an expert in numerous environmental science disciplines, regulations, permitting, and avoidance/minimization/mitigation analysis. She is an expert in environmental delineations, including wetland and forest stands, as well as COE and MDE permitting, forest conservation plans, rare/threatened/endangered species investigations, NEPA, aquatic ecology, ecological restoration, mitigation site monitoring, and ecological restoration construction inspection. Leyla is a Qualified Professional (QP) under the Maryland Forest Conservation Act and was also invited to be a member of the prestigious Mid-Atlantic Hydric Soils Committee. She has participated in numerous environmental evaluations and has assisted clients and agencies in developing creative avoidance, minimization, and mitigation solutions for unavoidable impacts to achieve project objectives while protecting resources.

Mr. Prad Maraj, PE, PSP, CCM

Prad is a Senior Vice President and leads JMT’S Project Controls practice and brings over 35 years of construction management experience, including 18 years of experience working with an international construction contractor and 17 years with JMT as an agency owner CM representative. He has extensive experience in construction claims analysis, with demonstrated expertise in providing testimony, in defense of contractor claims. He has been called as an expert witness for CPM scheduling to testify before the Maryland State Board of Contract Appeals during construction claims hearings and before the Maryland Attorney General’s Office’s Contract Litigation Unit for case preparation. Prad has also developed and conducted training courses on CPM scheduling, claims analysis and prevention for various Maryland public agencies. He is computer proficient with all versions of Oracle Primavera® scheduling and Document Control software. Prad is the former President of the Baltimore Chapter of AACE International.

Mr. Jim Morris, PE

Jim is the Director of Restoration Design and Policy in JMT’s Environmental Markets Group, focusing on turnkey projects. He has extensive experience in the planning, design, and oversight of large habitat restoration projects, including large-scale river restoration in support of contaminated sediment remediation and environmental dredging projects. He has experience in the development, design, and negotiation of stream, wetland and forest mitigation for a variety of private and municipal clients, as well as the monitoring, adaptive management, modeling and nutrient and sediment credit accounting associated with ecosystem restoration stewardship and mitigation projects. He performs watershed assessments and fluvial geomorphology assessments of stream reaches utilizing U.S. Environmental Protection Agency WARSSS (2006) and Function-Based Framework for Stream Assessment and Restoration (2012) methodologies, prepares engineering calculations, plans, specifications, and cost estimates for a variety of civil and environmental engineering projects. He serves the design lead for JMT’s turnkey project efforts, working closely with a team of engineers, scientists, surveyors, and real property specialists.
The **MISSION** of the Chesapeake Bay Trust is to promote public awareness and public participation in the protection and restoration of the Chesapeake Bay and its rivers and streams.

Our **GOAL** is to increase stewardship through grant programs, special initiatives, and partnerships that support environmental education, demonstration based restoration, and community engagement activities.

More online at [https://cbtrust.org/](https://cbtrust.org/)
Chesapeake Bay Trust, National Fish, Wildlife Foundation & Our Funding Partners Fund the Following:

- Conceptual site planning
  - Contextual planning - Where does your project fit in the larger picture?
- Best Management Practice (BMP) Engineering Design
- Implementation
- Maintenance
- Staff time and contractors to do the work
- Capacity Building

Our deliverables and the RFP are driven by the funding source(s), e.g., restricted sources such as federal, state, county or unrestricted.

We are Here to Learn from You

- What are your common obstacles?
- How can we help?
- Where is more training needed?
- What issues does your organization commonly see when trying to implement these larger (> $100,000) projects?
- What else?

Be very open during this training so we all learn together and have some new tools going forward with this work together.
Common Obstacles that we see

• Permit delays
  • Did the grantee discuss the idea with the permitting agency?
  • Did the grantee and permitting agency understand the process?
• Scope of work and/or expertise for project do not match (e.g., trying to do too much, overpromising)
• Costs and timelines are unrealistic
  • e.g., project can’t move forward due to insufficient funds OR >10% difference from proposed or
• Grantee and subcontractors need stronger contracts/scopes of work with their subcontractors to ensure cost and performance standards are met and reduce risk
  • Contractor does not deliver the product promised
  • No contract to back up the work completed
  • Contract not enforced to correct poor work
  • Poor work not detected and BMP failure occurs later
  • BMPs - Wrong place, wrong time, wrong size, etc.

What Does Success Mean?

• Projects that are realistic in their cost, timeline, and scope.
• Grantees that are confident in their skills to contract and manage the work.
• BMPs that are designed, built, and maintained to clean water and look good for the public.
• Grant funders spend funds allotted and report awesome projects with awesome results
  • Helps justify need for more $ in these areas
Class Outcome/Objective:
To educate, inform, and ultimately increase grantee capacity to successfully implement watershed restoration projects at the $100,000 scale and above.

Class Organization:
- Agenda
- Format
- Participation

Introductions:
A little about yourself.

Why are you here?

What do you want to achieve through this class?
MODULE 1 -
WHAT IS PROJECT MANAGEMENT? A RECAP & OPEN DISCUSSION

Presenters: Andrew Birmingham, PE & Jeremy Koser, PE
What is Project Management?

Learning Objectives

- Understanding the basic principles of managing a project
- Provide an overview of a typical design, construction and operation project lifecycle
- Reinforce your role as a Project Manager

Project Management – Open Discussion

What are your experiences with project management?

Q1: Why do projects fail?

Q2: Why do projects succeed?

Q3: What qualities/characteristics does a project manager need to meet success?

Q4: Provide a specific example of how you were able to mitigate a project related issue by using project management techniques.
What is Project Management?

Project Management is:

- Developing and managing the project’s **scope, schedule, cost**
- Project team and stakeholders
- Quality and risk
- **Managing** the work/getting work done through the project team

Project Management is NOT:

- Performing design and engineering activities
- Construction oversight and inspection
- Operations and maintenance activities
- Doing the work
What is Project Management?

Key Terms and Definitions

- **Scope**
  - Scope of deliverable
  - Scope of project

- **Schedule**
  - Format
  - Level of detail
  - Critical path

- **Cost**
  - Your cost (administration, procurement)
  - Design cost
  - Permit fees
  - Land cost
  - Construction costs
  - Maintenance and operating costs of facility

What is Project Management?

Key Terms and Definitions

- **Stakeholders**
  - You and your staff
  - Land owners
  - Owner
  - Regulatory agencies
  - Engineers
  - Contractors
  - Public

- **Quality Assurance/Quality Control Risk**
  - Unknowns/mitigation strategies/assumptions

- **Project Management Plan**
What is Project Management?

- Project selection/charter/project purpose/need/justification: What problem are we trying to solve?
- Design phase
- Construction phase
- Maintenance and Operations
- Your role is to MANAGE scope, schedule and cost for each phase. What does manage mean?
- Develop baseline (project plan)
- Monitor against baseline
- Minimize and manage changes, revise baseline when needed

Key Takeaways

- Your role is as a manager first; not a key technical resource
- You may have to fill in gaps in your technical knowledge to succeed as a manager.
- Understand the resources available to you (on your staff or procured)
- Project planning is a team effort and continues throughout the project
MODULE 2 - ORGANIZATIONAL READINESS

Organizational Readiness Form
Risk Register Form

Presenters: Andrew Birmingham, PE & Jeremy Koser, PE
Organizational Readiness

Exercise
Organizational Readiness Evaluation Form

Q: What are your organization’s strengths?

Q: What are your organization’s weaknesses?

Learning Objectives
Explore how my organization needs to prepare to take on large watershed restoration projects.

Identifying and Managing Risk.
Organizational Readiness Form

Does your organization have the following which are consistent with implementing large scale watershed restoration projects?

Check a value from 1-5, 1 being the least consistent and 5 being the most consistent. Check zero (0) if it does not apply.

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How would you rate your organization on the following project administration items?

Check a value from 1-5, 1 being the least prepared and 5 being the most prepared. Check zero (0) if it does not apply.

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How would you rate your organization on the below technical skills?

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Does your organization have the following tools required for implementing large scale watershed restoration projects?

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Organizational Readiness

What is needed to plan and execute a large Watershed Restoration Project?

Are these types of projects consistent with your organizations?

- Mission Statement
- Strategic Plan
- Relationships
- Staff Capabilities/Technical Skills

Do we need assistance from outside our organization?
Organizational Readiness

What are the project administration requirements?

- Contracting/Procurement Process & Documents
- Accounting Procedures
- Legal Advice/Representation
- Insurance Carrier/Advice
- Owner/Developer Agreements
- Project Management Procedures
- QA/QC Process

Organizational Readiness

What technical skills are required?

- Stakeholder coordination
- Public outreach
- Project planning
- Natural resources inventories/delineation
- Topographic & boundary survey
- Utility locating
- Soil boring drilling/infiltration testing
- Laboratory analysis
- Hydrologic / hydraulic analysis
- Water resource engineering
- Geotechnical engineering / analysis
Organizational Readiness

What technical skills are required?

• Structural engineering/analysis
• Traffic control design
• Computer Aided Design Drafting (CADD)
• Geographical Information Systems (GIS)

• Permitting/approvals
  • NPDES permitting
  • Stormwater management
  • Erosion and sediment control
  • Wetlands/waterways/floodplain impacts
  • Forest impacts
  • Critical Area
  • Grading permit/building permit
  • Right-of-way permit

Organizational Readiness

What data collection, design and management tools are required?

• Accounting Software
• Scheduling Software
• CADD Software
• GIS Software
• Water Resources Design Software
  • Hydrology
  • Hydraulics

• Hand Augers/Drilling Equipment
• Survey Equipment
  • GPS
  • Laser Level
  • Total Station
  • 3D Scanner
• Utility Locating Equipment
  • Test hole vacuum truck
  • Backhoe
What to consider for hiring contractors (design/construction) outside of my organization?

- Proof of Insurance
  - Professional Liability
  - General Liability
  - Workers Compensation
- Proof of Licensure
  - Business
  - Professional Engineer
  - Registered Landscape Architect
  - Professional Licensed Surveyor
- Bonding Capacity
- References
- Certifications

How can I mitigate risks for Design and Construction Contracts?

- Risk Identification
- Risk Avoidance
- Risk Allocation
- Risk Reduction
Risk Identification

- Financial/Budget
- Scope
- Schedule
- Design
- Permitting
- Liability
  - Bodily Injury
  - Property Damage
  - Economic Damages
  - Direct vs Indirect Damages
- Other Project-specific risks

Risk Avoidance

- All projects carry a certain amount of risk.
- Recognize and avoid unacceptable risks.
- Review project requirements and contract terms and conditions with appropriate consultants (insurance, legal, etc.) before signing a contract or committing to a project.
  - Avoid terms and conditions that create unreasonable and uninsurable risks.
  - Avoid responsibility for risks or factors outside of your reasonable control
Risk Avoidance

Avoid taking on projects with a scope beyond your capabilities and/or qualifications. Don't over-commit!

- **Knowledge and experience:**
  Make sure the project team is competent and appropriately staffed.

- **Personnel:**
  Make sure that adequate personnel will be available to do the work and meet deadlines.

Risk Allocation

Allocate risks to the appropriate party:

- Beware of contracts that shift all risk to one party.

- Be sure that the contract allocates specific risks to the party with the best ability to manage them.

- Use flow-down and indemnification provisions to allocate risks to the appropriate party.
Risk Allocation

Seek limitations of liability:

- Caps on damages (amounts/types)
- Mutual waivers of consequential, special, punitive damages and other types of indirect damages that may be too remotely connected to the project or services to properly control.

Risk Allocation

Obtain/require adequate insurance policies and policy limits to protect against potential losses/claims:

- General Liability
- Workers Compensation and Employer Liability
- Automobile Liability
- Professional Liability
- Builder Risk
- Other policies based on the nature of the project or services
• Reduce Risks by taking preventative actions to decrease the likelihood, frequency, and severity of the losses.

• Be proactive - prepare a risk response plan for foreseeable risks so that the project team knows what to do when a manageable risk is encountered.

  • Details and steps will depend on the nature of the project, location and the specific risks involved.

Communicate clearly and document all communications between the parties.

• Written documentation is best. Documentation and records to demonstrate that you met all contractual requirements, notice requirements, obtained timely approvals, and provided sufficient information to allow others to make informed decisions.
Risk Reduction

Communicate clearly and document all communications between the parties.

- Oral communication will occur often throughout a project, but all key details should be reduced to writing as soon as possible (meeting minutes, memoranda, notes, correspondence, email confirmation, etc.)

- Keeping and organizing good written records are vital to the success of presenting or defending against claims.
You are applying for a grant to design and permit multiple bioretention facilities on a local school property. You have applied for and been awarded grants in the past to install rain gardens on behalf of individual residences. This is your first time working with a school and you only have verbal approval from the principal to proceed with the project. You have identified several locations where bioretention seems feasible based on reviewing Google Earth images and a site visit with you and your staff. These include areas adjacent to the school building in the parking lot and at the corner of an athletic field very near an existing eroding stream channel. You do not have time or resources to perform any field data collection efforts prior to submitting the grant application. You engage a local engineer to review and price the design efforts but only have a verbal commitment on scope and fee. You do not know a contractor that can build this type of project and do not engage one prior to grant application submittal since this is only for the design and permitting stage.

Evaluate the major risk items in this scenario and develop a mitigation plan using the Risk Register Template. Keep in mind who is best equipped to "own" the risk.
## Risk Register Form

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Category</th>
<th>Risk Description</th>
<th>Risk Mitigation</th>
<th>Responsible Party</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Scope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Schedule</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Permitting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Risk Levels
- Low
- Medium
- High

### Risk Categories
- Financial
- Scope
- Schedule
- Design
- Permitting
MODULE 3 - PROJECT DESIGN & CM

Presenters: Matt Smith, PE & Safa Eslambolchi, PhD, PE, PMP
Learning Objectives

- How to effectively plan and scope your projects
- The role of the Project Manager throughout Project Design and during Construction
- Selecting and working with Construction Contractors
- How to avoid cost over-runs and delays

Project Planning

Ask yourself….what are the requirements/objectives?

- How the client explained it
- How the project manager understood it
- How the engineer designed it
- How the technician built it
- How the Client really wanted it
I. Scope of Work - READ THE CONTRACT

**Scope of Work for Contract No. HT 2823 – 000-0006**
(Substructure and Superstructure Rehabilitation to Various Bridges on I-895, from I-95 to I-695)

1. Perform a field investigation / inspection of each bridge within the contract. The purpose will be to locate, verify and obtain the necessary field measurements for the proposed repairs which were identified during the Phase I Preliminary Study. The field investigation will also ensure that the proposed repairs will correct the root cause of the bridge defect. All P1 and P2 defects will be addressed along with any P3 or M defects which may worsen and lead to future P1’s or P2’s. Those P3 or M defects which are superficial in nature or of a maintenance concern are to be either left as-is or to be repaired by MDTA forces. The intent of the repairs is that the bridge will be upgraded and remain in a satisfactory condition for the next 10 years. Direct costs for bridge access equipment during the field work will include the use of buckets trucks and/or snoopers as required.

2. Develop contract plans for the necessary repairs. The bridge plans are anticipated to consist of the following drawings:
   - General Plan and Elevation of each Bridge with General Notes and List of Proposed Work.
   - A Site/Access plan will show the Right of Way / Property Lines and any environmental features beneath the bridge where the Contractor’s access may be limited.
   - Relevant Substructure Elevation drawings to depict the locations and areas of the proposed repairs.

II. Schedule

![Project Schedule Chart]

- Building Project XXX: 222 days
- Notice to Proceed (NTP): 0 days
- Mobilize: 8 days
- Support of Excavation: 36 days
- Substructure: 50 days
- Superstructure: 55 days
- Electrical Rough-ins: 95 days
- Mechanical Rough-ins: 50 days
- Building Envelope: 33 days
- Interior Finishes: 40 days
- Final Site Work/Signage: 10 days
- Substantial Completion: 0 days

- Start dates: Jan 1'18, Jan 2'18, Feb 12'18, Apr 2'18, Jun 1'18, Jun 18'18, Aug 1'18, Nov 7'18
- Finish dates: Jan 1'18, Jan 11'18, Mar 2'18, Apr 20'18, Jun 15'18, Sep 12'18, Aug 24'18, Nov 7'18
- Slack: 0 days
- Deadline: Dec 1/1
- Completion: Nov 7'18
Project Planning

III. Budget/Cost

<table>
<thead>
<tr>
<th>PART I - GENERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PROJECT TITLE:</td>
</tr>
<tr>
<td>2. Task:</td>
</tr>
<tr>
<td>3. NAME OF CONSULTANT: Johnson, Mirmiran and Thompson</td>
</tr>
<tr>
<td>4. PROPOSAL DATE: 1/1/1990</td>
</tr>
<tr>
<td>5. DIRECT LABOR (Specify labor categories):</td>
</tr>
<tr>
<td>6. HOURS</td>
</tr>
<tr>
<td>Total Hours</td>
</tr>
<tr>
<td>7. ESCALATION:</td>
</tr>
<tr>
<td>8. RATE</td>
</tr>
<tr>
<td>Escalation</td>
</tr>
<tr>
<td>9. INDIRECT COSTS (Specify):</td>
</tr>
<tr>
<td>10. OVERHEAD AND PAYROLL BURDEN:</td>
</tr>
<tr>
<td>11. TOTAL OF DIRECT LABOR &amp; INDIRECT COSTS (Combined Sum of items 6 &amp; 7)</td>
</tr>
<tr>
<td>12. PROFIT</td>
</tr>
<tr>
<td>13. TOTAL PROFESSIONAL FEE (Combined Sum of items 8 and 9)</td>
</tr>
<tr>
<td>14. OTHER DIRECT COSTS (refer to attached itemization):</td>
</tr>
<tr>
<td>a. DIRECT COSTS</td>
</tr>
<tr>
<td>b. TASK PRICING (UNIT-BASED)</td>
</tr>
<tr>
<td>c. SUBCONSULTANT(S)</td>
</tr>
<tr>
<td>d. OTHER DIRECT COSTS TOTAL (Combined Sum of items a,b,c,d)</td>
</tr>
</tbody>
</table>

IV. Project Team Members (Internal and External) / Worksharing
Project Planning

V. Communication and Meetings

VI. Quality Control
VII. Document Management

VIII. Safety
IX. Risk Management

"Risk comes from not knowing what you're doing."

- Warren Buffett

Open Discussion

How many of you have managed a project (or portion of a project) that the scope was prepared by someone else?

How many of you have written a scope of work?

Who has written a scope of work and then executed and managed the same scope of work to completion?

---

Scope of Work

The following Scope describes the work that will be completed to evaluate the feasibility of bicycle and pedestrian facility that connects the proposed pedestrian walkway on the Route Bridge to the local roadway systems in Wethersfield and Glastonbury, CT. The primary pedestrian walkway and its associated multimodal trail connections is to provide a safe, functional transportation link across the Connecticut River for pedestrians and bicyclists utilizing non-motorized modes of transportation to meet their regular travel needs.

Under the Scope, CTDOT and the consultant, Cough Harbour & Associates (CHA), will Advisory Committee to develop and assess the feasibility of various alternatives that will stated purpose of the walkway and its multimodal trail connections. The approximate illustrated in attached Figure 1.

The Scope is organized into the following tasks:

- **Task 1. Project Coordination**
- **Task 2. Data Collection and Research**
- **Task 3. Alternatives Development and Evaluation**
- **Task 4. Documentation**

**Objective:** This task defines the study development and stakeholder/community involvement.

**Coordination Meetings**

CTDOT and CHA will meet with other involved agencies (such as FHWA, CTCOG, CDOT, etc.) to coordinate progress; discuss documentation requirements; resolve potential study products; etc.

**Advisory Committee Meetings**

An Advisory Committee (AC) will be established and will be actively involved in the development study and its products. The AC will be composed of stakeholders and representatives of FHWA, CTCOG, Towns of Wethersfield, Glastonbury, and East Hartford; state and federal agencies; Goodwin College; and local bicycle and pedestrian advocacy groups. It is three AC meetings (or more, as required) will be conducted at key study milestones:
Scope Planning

Learn Project and Client Requirements

- Scoping meeting
- Field meeting
- Develop scope outline (Work Breakdown Structure or WBS) to match client and project requirements

Know client standards and standard operating procedures

- Design manual, permitting, milestones, etc.
- Submittals
- Documentation (such as design reports)
- Addressing different stakeholder requests and requirements
- How often will you meet?
- Review requirements
Scope of Work

General Parts of a Scope of Work

• Detailed list of work activities that will be performed
• Identify work to be performed by each discipline
• Identify who the individuals are that will be performing the work
• Identify any assumptions made that could affect how work is performed
• Identify the project limits
• Identify information or work to be performed or provided by others
• What are the client’s responsibilities?
• Exclusions (when appropriate?)
• Avoid guarantees or implied warranties

Scope Writing: What to Use

<table>
<thead>
<tr>
<th>DO NOT USE</th>
<th>EXAMPLE REPLACEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>At all times</td>
<td>Will be done once per…</td>
</tr>
<tr>
<td>Insure, ensure, assure</td>
<td>Reasonable effort will be made</td>
</tr>
<tr>
<td>Periodically</td>
<td>Every Thursday…</td>
</tr>
<tr>
<td>Supervise, inspect</td>
<td>Observe and report</td>
</tr>
<tr>
<td>Certify, warranty, guarantee</td>
<td>Statement as to our judgement based on…</td>
</tr>
<tr>
<td>All existing information will be gathered</td>
<td>Readily available information will be reviewed and collected as needed…</td>
</tr>
<tr>
<td>Will complete all project services</td>
<td>Will prepare and submit for review and approval normal engineering drawings suitable for construction…</td>
</tr>
</tbody>
</table>
“Existing and future land use will be reviewed with city staff to reach a consensus on the conditions that will be used to evaluate storm water impacts”

Q: What can we do to fix this?

**Developing a WBS**

- Define and sequence activities
- Determine what resources will complete the work
- Estimate activity durations
- Other direct costs
Developing a WBS

- Account for 100% of the work
- Do not duplicate sub-tasks
- Hierarchical
- Focus on deliverables and outcomes instead of actions

Compare your WBS Against your Scope

…and make sure they are the same!
Project or Task Award

- Notify project team
- Develop Project Management Plan (PMP)
- Baseline project schedule
- Schedule Project Kick-Off Meetings
  - Internal Kick-Off Meeting
  - External Kick-Off Meeting

Internal Kick-Off Meeting

- Review PMP with project team
- Scope of work
- Schedule
- Budget
- Project team responsibilities
- Meetings and communication
- Quality control
- Safety
- Project risks and mitigation
External Kick-Off Meeting

• Who should be there?
• What topics should be discussed?

Monitor and Control Project Work

• Meet regularly with project team to discuss progress, issues, and risks
• Review and update PMP and project schedule
• Monitor project budget against scope and WBS
• Compare project actuals against WBS
• Determine cost to complete
• Report progress to client and identify and document change requests
Construction Management - Overview

- Evaluating Qualifications/Experiences
- Material Costs
- Request for Information (RFIs)
- Schedule Restrictions
- Permits During Construction
- Inspection and Documentation
  - Construction Oversight
  - Utilization of Proper Equipment
- OSHA
- Miss Utility

Construction Management

The Construction Phase
- Most activity occurs in this phase (and most risk for cost overruns!)
- Your role?
  - Make timely and decisive decisions
  - Defined communication plan and levels of authority
- Construction Manager
  - Expertise and experience
  - Inspects work and recommends payment
  - Day-to-day point of contact
The Construction Phase

- Role of the Designer during construction
- Respond to Requests for Information (RFIs)
- Review and recommend approval of shop drawings and material specifications
- Review change requests
- Site visits as required by regulatory agencies
- Bid justifications

Bid Justifications

- Material costs vary due to:
  - Availability
  - Quantity needed
  - Location

- Search for information that is applicable to your project
  - Price indexes
  - Cost estimating manuals
Construction Management

Selecting a Contractor

- Procurement by sealed bids/invitation for bid
  - Lump sum or unit price
- Low bid vs. weighted selection (cost + schedule)
- Qualifications and similar experience
- References
- Equipment and supplies
- DBE Requirements

Construction Management

Contractors use a detailed day-to-day schedule

Use a baseline schedule with updates on a bi-weekly or monthly basis

Project managers focus on high-level, big-picture schedule

- Focus on critical path activities!

Include schedule milestones in contract conditions

- Liquidated damages
- Work critical to project completion

Schedule Control

Time of year/week/day restrictions
Construction Management

Change Orders

- Establish communication process up front for Requests for Change (RFCs)
- Quick and decisive responses to avoid delays and claims
- **Remember**...can be avoided with clear PSE deliverable and a constructability review
- Documenting and tracking changes
- Update project documents

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Description</th>
<th>Contractor Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency Action</td>
<td>• Changing the plans and specifications</td>
<td>• Contractor is compensated. If another contractor’s non-performance causes the change, the other contractor should be back charged</td>
</tr>
<tr>
<td></td>
<td>• Altering the time to complete the work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Changing the contractor’s means and methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Regulatory changes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Third party delays where the agency is responsible for coordinating the third party work</td>
<td></td>
</tr>
<tr>
<td>Differing Site Conditions</td>
<td>• Subsurface conditions differ from those represented by the construction documents</td>
<td>• Contractor is compensated</td>
</tr>
<tr>
<td></td>
<td>• Unusual conditions occur that could not reasonably be anticipated</td>
<td></td>
</tr>
<tr>
<td>Errors or Omissions</td>
<td>• Errors or omissions in the design plans and specifications</td>
<td>• Contractor is compensated. The designer should be back charged</td>
</tr>
<tr>
<td>VE</td>
<td>• Contractor proposes a change that will reduce the project costs</td>
<td>• Agency and contractor share the cost savings</td>
</tr>
<tr>
<td>Contractor Action</td>
<td>• Contractor changes means and methods and/or delays project due to their own non-performance</td>
<td>• Contractor is not compensated but may be given additional time for third party delays</td>
</tr>
<tr>
<td></td>
<td>• Third party delays where the contractor is responsible for coordinating the third party work</td>
<td></td>
</tr>
</tbody>
</table>

**Construction Management**

**Permitting**
- Contractor responsible for permits related to the contractor’s work
  - OSHA
  - Miss Utility
- Communicate clearly the requirements of regulatory agencies to contractor
  - When to contact inspectors
  - As-built requirements
  - Explanation of project function may help explain sequence of construction, materials selection, etc.

**Construction Management**

**Inspection and Documentation**

1. **Inspector - Daily**
   - There on behalf of the owner
   - Documents materials and durations for contractor payment

2. **Inspector (Other): As Specified**
   - Erosion and sediment control, utilities, proprietary items, etc.

3. **Designated Specialist: As Specified**
   - Familiar with design and construction process to facilitate adjustments and questions in the field
   - Same authority as an inspector
Construction Management

“Third Party” Work

- Existing facilities impacted by the project
  - Utilities
  - Infrastructure
- Complete early to avoid delaying the contractor
- Negotiate the timing and duration
- Costs for betterment should be paid by the third party

Construction Management

Project Closeout

- Prepare punch list
- Final walkthrough of finished project
- Resolve outstanding changes/claims
- Obtain project acceptance from stakeholders
- Document lessons learned on project
Construction Management

Exercise:

Construction Photos/Lessons Learned

Notes
MODULE 4 - PERMITTING

Presenters: Kristin Aiosa and Leyla Lange
Learning Objectives

- Determine what permits you need for your project/Project specific requirements
- Schedule - when to engage in the process
- Post-authorization/Permit conditions (general and special)

Remember: *One size does not fit all!*

Step 1 – Define your Project & Review Online Resources

Determine what permits you need for your project/Project specific requirements
Step 2 – Pare Down the List

Determining what permits you need for your project/Project specific requirements

Don’t count on on-line screening!

• Wetland and Waterways Permitting (Joint Permit Applications)
• Critical Areas (Tidal Zones)
• Endangered Species (State/Federal)
• Cultural Resources
• Forest Conservation Plans (FCPs)

• NPDES/GP for Construction Activities (NOI)
• Erosion & Sediment Control
• Stormwater Management (if applicable)
• Additional State/Local Permits (e.g., Grading, Access)

Examples of Additional State/Local Permits
Step 3 – Conduct Agency Coordination

What are the project administration requirements?

- Early and often
- Pre-application meeting (walk-through)
- Identify potential avoidance and minimization measures to consider
- Refine concept designs
- Document everything
- Follow up as necessary – don’t assume the loop is closed, especially with on-line coordination

Pre-application meetings often resolve many issues early in the process.

Step 4 – Perform Field Delineations

Identify natural and cultural resources early in the process to address potential impacts with the appropriate agencies.

- Wetlands and waterways
- Forest resources
- Cultural resources
- RTE species
Sample Flowchart – Identifying your Necessary Permits

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

Step 9
Sample Flowchart Exercise

You are working on a stream restoration project. You have developed your concept design, which will result in an area of disturbance of approximately 2.23 acres. You have reviewed available online mapping and identified that the project will impact one perennial stream, two adjacent wetlands, a FEMA mapped 100-year floodplain, and a forest. The project construction will require utility relocations and access from a private property owner. Using the steps we have reviewed so far, take 10 minutes and go through the process in your groups to identify all necessary agency coordination, fieldwork, and permits.
Step 5 – Prepare Permit Application(s)

- Have a robust project description
- Determine completeness of plans necessary to support application (30%, 60%, 90% or 100%)
- Accurately prepare impact plates (if necessary)
- Document avoidance and minimization efforts
- Ask questions of your reviewer if any pop up
- Perform a **thorough** QA/QC review
- Include necessary fees

**REMEMBER:** Follow all Checklists

Step 6 – Address Comments (Group Activity)

How to facilitate the approval process...

- **Be proactive** - follow up with reviewer after submission
- **Never assume comment understanding** – Ask the reviewer for clarification
- **Address comments in a timely manner** - control the portion of schedule that you can control
- **Provide detailed response to every comment** - reviewers are not mind readers
- **Remember that permit approvals follow a process**
Tips to Managing Expectations

• Don’t overpromise!
  Applies to both agencies and stakeholders

• Realistic when establishing schedule

• Factor in response to comments (lather, rinse, repeat)

• Effectively and efficiently address comments – don’t anticipate the agencies will read between the lines

• Understand what will be required after authorization has been granted (permit conditions)

• Be prepared to mitigate for your project’s impacts

Notes
Permitting Flowchart

1. Identify Project Type (e.g., Watershed Restoration Project)
2. Conduct Field Reviews/Delineations
3. Understand Project Impacts/Identify Necessary Permits and Agency Coordination
4. Address all Agency Comments/Provide any Additional Documentation
5. Secure all necessary Permits, Clearances, Authorizations
6. Construct Project
7. Conduct Impact Assessment/Identify Mitigation Needs
8. Submit all Permit Applications/Conduct any Remaining Agency Coordination
9. Closeout Permits at Construction Completion
10. Follow Permit Conditions
11. Celebrate Success!
Case Study 1: Governor Harry W. Nice Bridge Replacement Project

- Two USACE Districts (Baltimore and Norfolk)
- Maryland and Virginia State and Local Permits
- US Coast Guard
- Essential Fish Habitat
- Biological Assessment (Atlantic and shortnose sturgeon and Designated Critical Habitat)
- Cultural Resources (Maryland, Virginia and underwater)
- USFWS Bald Eagle and Northern Long-eared Bat
- National Park Service
- NEPA Re-evaluation
- Complex Mitigation

Case Study 2: Shipley’s Choice Dam Removal
Case Study 3: East Prospect Streambank Stabilization

Q: What is a project that you have worked on that has gone very poorly or very well with respect to permitting?
Permitting Pitfalls (Group Activity)

Q: What are common permitting pitfalls?

Risks that can de-rail your project...

• Not engaging project stakeholders
• Project Manager’s understanding of:
  • Permitting requirements and process
  • Scheduling implications, durations, lead time, etc.
    • Time of year restrictions
• Permit Conditions (post-authorization)

Coordination – Project Success!
Permitting Quiz

Exercise
Permitting Quiz

Notes
MODULE 5 - BIDDING & CONTRACTING

Presenter: Prad Maraj, CCM, PE, PSP
Learning Objectives

What is Construction Management?

Understand how to use and interpret Construction Contracts, Drawings, and Specifications

How to avoid cost over-runs, delays and prevent Claims

Overview of Construction Management

- Evaluating Qualifications/Experiences
- Material Costs
- Request for Information (RFIs)
- Schedule Restrictions
- Permits During Construction
- Inspection and Documentation
  - Construction Oversight
  - Utilization of Proper Equipment
- OSHA
- Miss Utility
Role of the Designer during construction

- Respond to Requests for Information (RFIs)
- Review and recommend approval of shop drawings and material specifications
- Review change requests
- Site visits as required by regulatory agencies
- Bid justifications
Contractors Perspective – Construction Management

Goal:
To complete the project on time, within budget and of good quality

Managing the Construction Process

Considerations for Selecting a Contractor

Q: What consideration should you think about when selecting a contractor?

- Procurement by sealed bids/invitation for bid
  - Lump sum or unit price
- Low bid vs. weighted selection (cost + schedule)
- Qualifications and similar experience
- References
- Equipment and supplies
- DBE Requirements
Methods for Delivering a Construction Project

- Owners Construction Forces
- Owner’s management of a contractor
- Design Build
- Construction Management Contract

What is a Contract?

A legally enforceable agreement between two or more parties. It may be oral or written. A contract is essentially a set of promises. Typically, each party promises to do something for the other in exchange for a benefit.

Five characteristics
- Legal Purpose - within the law
- Mutual Agreement - meeting of the minds offer & acceptance
- Consideration - value in exchange for benefit
- Competent Parties - sound Mind Legal age
- Free Engagement - free will
What makes a Construction Contract different?

Time - it’s of the essence

A construction contract provides a legal binding agreement, for both the owner and the contractor, that the executed job will receive the specific amount of compensation or how the compensation will be distributed.

Contract Definitions

**Agreement** - The entire arrangement between the owner and the contract or detailing bidding, bonds, liabilities, construction services, legal and financial rights and responsibilities, quality of workmanship and numerous other items is packaged into the set of contract documents.

**Conditions of contract** - Q: What conditions have you seen in your contracts?

<table>
<thead>
<tr>
<th>Procedures For Problems</th>
<th>Legal Aspects</th>
<th>Rights and Responsibilities</th>
<th>Guidelines for Administering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address the procedures for dealing with situations and problems that may occur with the contractor.</td>
<td>Addresses the legal aspects of the arrangement between the contractor and owner.</td>
<td>Details the rights and responsibilities of those involved in the contract</td>
<td>Provide guidelines for administering the contract, define the legal relationship, and among the parties affected by the contract (e.g., subcontractors, the engineer, construction manager, etc.).</td>
</tr>
</tbody>
</table>
**Contract Definitions Continued**

**Contract Drawings:**
- Drawings prepared by A/E used for bidding become contract drawings.
- **Specifications** - standard and special

**Contractor Definitions Continued**

**Bid** – A statement of price, terms of sale, and description of the supplies, services, construction or construction-related services offered by a bidder to the State in response to an Invitation for Bids.

**Change Order** – A written order, signed by the owner, that amends the Contract by adding, deleting, or modifying price, time, work and/or conditions that was not originally addressed in the Contract.

**Claim** – A request, demand, or assertion of rights by a Contractor, for consideration, compensation, or payment under the terms of the Contract, such as for a disputed change, adverse action or inaction of the owner, or any other adverse impact to the Contractor’s work not attributable to the Contractor. A construction claim consists of two major parts:

- **Entitlement (Merit)** – A detailed description of the impact, its cause, and basis for which relief is sought.

- **Damages (Quantum)** – Detailed outline, calculations, and support documentation for the compensation (Time and/or money) requested.
Delay – Any failure to complete a construction activity (or series of activities) within the time planned. There are two basic categories of delays:

**Excusable** – Unforeseen and beyond the control of the Contractor. These are two types:
- **Compensable** – A delay for which the Contractor is entitled to compensation (delay damages) as well as an extension of Contract Time.
- **Non-compensable** – A delay for which the Contractor is entitled to time, but not additional compensation. Any concurrent delay falls under this category.

**Non-excusable** – A delay for which the Contractor has responsibility and as such is entitled to neither time nor compensation.

Dispute – Any conflict or disagreement between the owner and the contractor. This may be regarding a question of fact, or the interpretation of the contract.

Liquidated Damages – The additional costs incurred by either the owner or the owner on the behalf of the public as a result of the Contractor failing to meet time related provisions of the Contract.

Liquidated Damages are not penalties, but actual or estimated compensation for the additional cost incurred by the Owner.
**Scheduling & Planning**

Q: Why is it important to schedule and plan?

- Planning and scheduling are distinct but inseparable
- The process of **planning** primarily deals with selecting the appropriate policies and procedures in order to achieve the objectives of the project.
- **Scheduling** converts the project action plans for scope, time cost and quality into an operating timetable

**Two Types of Schedules**

- Bar Chart - simple timeline done graphically on a timescale typically in Excel
- CPM (Critical Path Method) - Network of activities with logical relationships

![Diagram of activity sequence](image)
Bar Chart Schedule

Components:
- Activity Description
- Activity Duration (in calendar days)
- Most common type of schedule required by project specifications.
- No relationship ties.
- Very Subjective, hard to determine if Project is delayed and identifying delaying activity.

Critical Path Method Schedule

Step-by-step project management technique for process planning that defines critical and non-critical tasks with the goal of preventing time-frame problems and process bottlenecks.
Bar Chart vs. Critical Path Method

Bar Chart

No Relationships between activities
No algorithm, “variables” are assigned by scheduler
More Subjective

CPM

Defined Relationships between activities
Algorithm calculates variables, Total Float, Early/Late Dates
More Objective

Action to take: Include the requirement for CPM in your specifications

Document Control

Written records required for construction

- Application for payments
- Daily Reports
- Change Control
- Special Inspection Reports
- Claims Analysis
- Meeting Minutes
- Request for Information
- Submittals

Q: Which is the most important?
Q: What is missing?

**Document Control - Inspector Daily Reports**

**ITEMS M issed:

- Component A
- Component B
- Component C

**NOTES**

- Component D
- Redacted text
- Component E

**LOCATION INFORMATION**

- Location 1
- Location 2
- Location 3

**QUANTITY OF WORK COMPLETED**

- Item 1: 10
- Item 2: 15
- Item 3: 20

**DETAILED INFORMATION**

- Item 1 Details
- Item 2 Details
- Item 3 Details

**CONDITIONS**

- Weather: Sunny
- Precipitation: None

**PERSONNEL**

- Inspector A
- Inspector B
- Inspector C

**MATERIALS**

- Type A
- Type B
- Type C

**OTHER**

- Note 1
- Note 2
- Note 3
Change Orders

To Manage

• Establish communication process up front for Requests for Change (RFCs)
• Quick and decisive responses to avoid delays and claims

To Avoid – Key Takeaways

• Clear PSE deliverable
• Constructability review
• Documenting and tracking changes
• Update project documents

Change Orders

Avoid the rubber dinghy turning into a yacht!
Utilities

- Existing facilities impacted by the project
  - Utilities
  - Infrastructure
- Complete early to avoid delaying the contractor
- Negotiate the timing and duration
- Costs for betterment should be paid by the third party

Key Takeaways:
- Identify which utilities are affected (U/G or Overhead)
- Locate prior to excavation
- Timely notice for re-location

Utilities

Contractor responsible for permits related to the contractor’s work
- OSHA
- Miss Utility

Communicate clearly the requirements of regulatory agencies to contractor
- When to contact inspectors
- As-built requirements
- Explanation of project function may help explain sequence of construction, materials selection, etc.

Key Takeaways:
Different agencies than environmental permitting
Delays can be categorized into two areas:

- **Excusable** delays occur when the affected party is entitled to claim for a **time extension, compensation or both** as established by contract documents.

- **Non-excusable** delays are contract related issues that the contractor or party affected will need to bear the responsibility that could be but not limited to cost and time.

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**How to Deal with Delays**

1. Gather all the information from the drawings and contract.
2. Establish Merit.
3. Assign Responsibility.
4. Resolve Amicably.
5. If can't resolve, prepare for litigation.
Claims Case Study: Edmondson Avenue

Claim Summary

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>%</th>
<th>AMOUNT</th>
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<tr>
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<tr>
<td>FIELD OFFICE OVERHEAD</td>
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<tr>
<td>DIRECT COST OF REPAIR WORK</td>
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<td>IDLE EQUIPMENT</td>
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<td>EXTENDED MOT</td>
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</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
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</tr>
</tbody>
</table>
Key Takeaways for Proposals

1. Be specific - not indefinite or vague and by all means avoid ambiguity
2. Be brief - state only the necessary facts; avoid unnecessary words, phrases and avoid repetition
3. Use correct grammar and short sentences
4. Specify standard sizes and patterns when possible
5. Do not specify both methods and results
6. Do not specify requirements that conflict with each other
7. Do not justify a requirement
8. When inserting a national standard (e.g., ASTM), read the standard to be sure that it does not conflict with job requirements

Key Takeaways for Construction

1. Read the contract, study the drawings
2. Understand the contractor's plan
3. Enforce the specifications
4. Keep proper records
5. Partner with the contractor
6. Watch for red flags
7. Safety is priority
MODULE 6 -
INSURANCE, LIABILITY &
BONDS

Presenters: Matt Smith, PE & Jim Morris, PE
Learning Objectives

- Understanding the basic principles of insurance and surety for a project
- How this translates to your project
- Discussing real world experiences

Insurance

It's for when things go wrong!

- Manage Risk of Monetary Loss
- Manage Risk for Project Viability / Ability to Complete
- Compensate for Legal Defense
- Varies by State
Liability

• Responsible or Answerable in Law

• Civil vs. Criminal

• Breaking the law isn’t covered by liability insurance!

• Personal / Organizational Liability Insurance

• Umbrellas

It is best to talk to your agent, carrier, and/or attorney to understand what you need!

Example Project – Stormwater

For a stormwater project, you may be liable for:

• Property Damage

• Accidents

• Contractor / Other Injury

• Errors and Omissions

• Negligence
Managing Risk – Bonding and Safety

Bonding and Other Surety/Assurances

• Bid Bond
• Performance Bond for Project
• Bonding required for Permit
• Retainage
• Liquidated Damages

Example Project – Stormwater

What level of insurance or Surety is needed for a project?

• Bid Bonds typically are 20% of bid value
• Performance bonds should cover the entire project and typically cost 3%
• Retainage on planting often 20% and held for two years
• Liquidated damages vary
• You and your attorney/carrier should consult what needs are required on a project by project basis.
Budget

Planning for Costs of Insurance and Surety

• You need insurance and surety to ensure project is completed and everyone is made whole.
• Non-profit organizations are not specially exempt from liability
• If something goes wrong, everyone is getting sued
• Duration of project can impact costs of these items
• These are not “unnecessary administrating costs”
• You do not want to waive any of these requirements

Activity

What have you been involved with?

• Who has used insurance and had a claim for their organization?
• Were you properly insured?
• Who has had a contractor fail to perform? How was it reconciled?
• Have you ever been sued over a project?