

Centerpoint Connect

ROOFING PROJECT MANAGEMENT GUIDE

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Introduction

The purpose and scope of this manual is to provide a Roofing Contractor with Project Management and Production process tips. There are several factors which impact the delivery and management of a roofing construction project, the manual highlights:

Project Planning Session – Identifying, documenting, and implementing Client requirements.

Exact and detailed Communication.

Project Management & Safety & Risk: Project Safety – Work safe. Zero accidents.

- The objective of Safety & Risk programs is to ensure the physical safety of employees and Approved Subcontractors and that the contractor is compliant with all Federal and State OSHA regulations.
- **Benefits include:**
  Reduction in WC, GL, and Auto premiums and costs.
  Fewer Personal and Auto Accidents – reduces direct & indirect financial costs from injuries.
  Lower EMR – decreases Workers Compensation premiums costs.
  Decreases OSHA litigation and internal defense costs (business disruption).
  Decrease project and contractual risks.
  Project is Complete/Complete/Complete. Documenting best practices. What the contractor wants to continue to do on every project – it worked. What the contractor will not do again – what issues to mitigate so the problems are not repeated.

Project Management & Estimating:

- The objective of the Estimating initiative is to ensure the accuracy of the estimates, which are the basis for the project planning process.
- Proper estimate accuracy and timely preparation and review.
- **Benefits include:**
  Enhanced accuracy and standardization:
  Material requirements (including accessories).
  Production rates.
  Waste calculations and Variance Indicators.
  Decreases estimating and review time.

Project Management & Productivity & Quality: Get it done. Do it once. Do it right.

- The objective of the Productivity initiative is to ensure projects maximize Gross Profits while delivering a high-quality product.
- Reduction in labor costs, equipment rentals, and material waste.
- **Benefits include:**
  Project objectives and schedule are properly communicated.

Productivity through proper planning and workflow.
Enhanced quality through proper training.
Reduces re-work and increases overall profitability.
Enhances communication with owners, consultants, and other project participants.
Changes in work, schedule, and costs are margin killers.
Balance the constraints of scope, quality, schedule, budget, resources, and risk.
Obtain the expected margin.

Project Management & Service:

- The objective is to develop standardized and sustainable Service Departments.
- Strengthen Service (Sales and Delivery) Department, where Service contributes a greater percentage of the total company revenue. Assists in the development of Account Management and positive relationships with Clients.
- **Benefits include:**
  Promotes customer relationships vs. competitive bidding.
  Develop More Construction Projects with Same Client.
  Increase Service until roof replacement is required.
  Increased overall Gross Profit.
  Improved Cash Flow.

Project Management & Technology:

- The objective of the technology initiative is to increase the accuracy and timely recording and reporting of project and company performance. Also, to provide customers with asset management reporting during the budgeting and the execution phase.
- Aerial Overviews, Organizational Software, Communication Software, Reporting Software.
- Benefits include:
  Service, Proposal, and Project Execution.
  Customer Reporting – Photos/Description of Work Completed.
  On-Site Electronic Access to Project.

Information for Personnel through Tablets and Smartphones.

- Aerial Overviews.

Overviews are used for Planning and Communication.

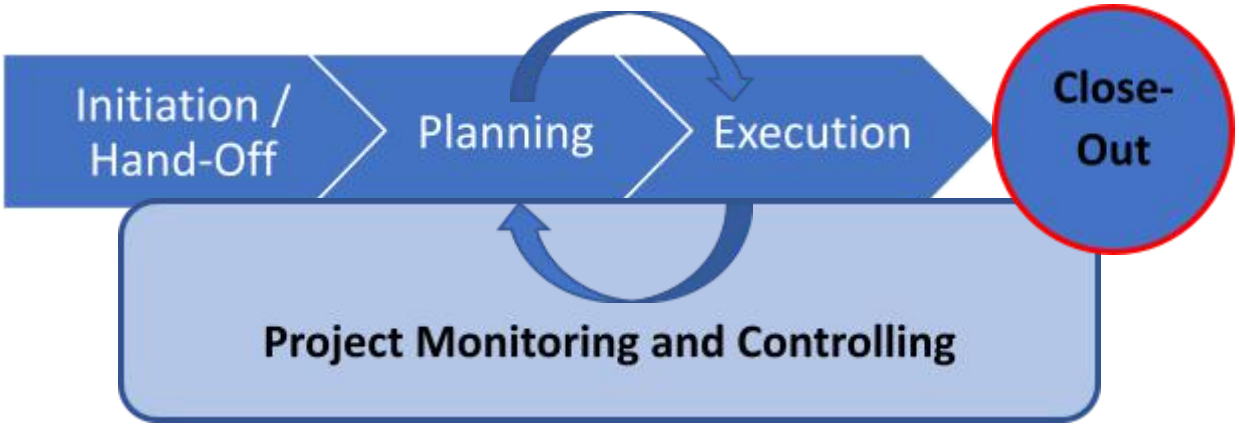
- Accounting, Performance.
- Job Costing and Reporting.
- Change Orders.

Project Management & Supply Chain:

- The objective of Supply Chain programs with Suppliers and Manufacturers can provide a competitive advantage.
- Alignment with National Suppliers and Manufacturers to further strengthen key industry relationships.
- **Benefits include:**
  Material Rebate programs which result in significant savings.
  Competitive Pricing.
  Prompt response regarding material issues and technical support.
  Expedited Warranty.

PROJECT LIFE CYCLE

Projects may vary in size and complexity. Projects have a defined start and completion. Projects have an initiation/hand-off phase, planning phase, execution phase, monitoring and controlling phase and a close out phase. The monitoring and controlling phase starts at initiation and finishes at close out to mitigate risk.



Project Initiation / Hand-Off

The first phase of Project Management is the allocation of the project to a Project Manager (PM) and handing off all data to the PM for gathering the project requirements. Documents are handed off both on paper and electronically. PM continues to add to the Paper and electronic copies of the documents, as needed, throughout the project.



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PROJECT MANAGEMENT FILES

A Project Book is where all the forms and documents are held. The Project Book is best held electronically.

Determine a location where the documents can be accessed in the field or away from the office through smart phones and tablets.

A suggested Table of Contents for the Project Book is the following:

Project Naming Convention of Folder:
Client – Property – City, State – Date of Contract – New Roof System Description

Note: Create a folder with the Client's name and put all projects for the Client in that folder with the same naming convention.

Project Information folder
Documents contained:
- Description
- Aerial Overview with an Outline of Roof Areas Under Project Scope
- Scope of Work
- Proposal
- Contract
- POs
- Change Orders

Project Execution folder
Documents contained:
- Project Schedule
- Loading Plan
- Safety Set-Up
- Vendor Information

Material Data
Documents contained:
- Manufacturer Specifications
- Manufacturer Details
- Metal Color Selection

Subcontractor Data
Documents contained:
- Subcontractor Agreements
- Subcontractor Scope of Work

Warranties
Documents contained:
- Manufacturer Warranty
- Contractor Warranty
- Subcontractor Warranty

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Project Manager (PM)

The Team member is charged with responsibility for the complete and satisfactory execution of the entire project. The PM deals with the outside world (owner, Subcontractors, design professionals, vendors). However good or bad the PM is on a project will directly reflect on the contractor's reputation.

General duties of the PM:

- Coordinating communication flow with all parties (external and internal).
- Coordinating on-site with corporate office activities.
- Organizing and overseeing job site administration.
- Organizing and coordinating field supervision.
- Assisting in the procurement of material and equipment suppliers.
- Developing, monitoring, updating, and communicating the progress schedule and its periodic revisions.
- Managing subcontractor schedules, quality of work, coordination with other trades, and payments.
- Coordinating job costs and job budgets.
- Creating and maintaining Safety on job site.
- Identifying and resolving all change orders.
- Establishing and maintaining relationships with external contacts.

Field Superintendent or Approved Subcontractor Field Manager

The team member is charged with the supervision of all field activities related to physical construction. The team member is accountable for work quality and time schedule.

General duties of the PM:

- Generate, secure, and confirm all information needed to create, monitor, and modify the progress schedule.
- Develop the progress schedule with the Project Manager.
- Participate in scope reviews to properly coordinate the project.
- Identify work sequence considerations.
- Monitor actual versus required work.
- Determine if subcontractors are providing sufficient workforce and hours of work.
- Monitor the delivery of materials, equipment, and any other work supplies to ensure that the resources are on the jobsite by the time needed. Ensure that deliveries contain all materials ordered and were not "short-shipped".
- Direct field workers.
- Be familiar with the Scope of Work to ensure that any changes are quickly noted, and proper authorization is received (change order process).
- Prepare daily reports and any other needs to document projects for external and internal contacts.



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PLANNING SESSION
OVERVIEW

Planning is the most important phase to ensure a successful project. Without a thorough plan, the project will not have the intended outcome.

To begin the planning process, a Fully Executed Contract is needed. The fully executed contract is the substantiating document for the project. Client requirements and scope of work are audited against the contract.

Planning Session Tips:
Spend the time and effort to develop and assemble the required documents.
Dedicate proper amount of time to review with Field Management

To ensure a successful project, "Focus on the Field" to confirm that the:

- The Field understands they have complete support behind them.
- The Field fully understands the roofing system installation requirements.
- The Field fully understands the project scope and workflow.
- The Field fully understands the daily and weekly expectations.
- The Field fully understands the schedule requirements.
- The Field has the manpower, equipment, & tools required to deliver the project.
- The Field understands the labor budget to deliver the project.
- The Field understands the Safety requirements and Emergency actions.
- The Field understands the reporting requirements.
- The Field understands that there must be mutual respect for all field employees.
- The Field understands which prefabricated items are to be done off-site.

Personnel Required:

- Estimating
- Project Manager
- Field Manager
- Approved Subcontractor Manager
- Procurement Personnel

Documents Presented/Discussed:

- Project Contract
- Specifications and Drawings
- Project Estimate
- Project Submittals
- Project Forms
- Daily Reports

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PLANNING SESSION OUTLINE

Each Process Below is Described in Detail in its own Section. Some of the Processes are On-Going until Project Completion. Please see Appendix for sample forms.

- **Project Information**
  - Identify Project Team
  - Request Certificate of Insurance
  - Request Payment and Performance Bond (if needed)

- **Project Safety:**
  - Review Site Specific Safety Plan and reporting requirements
  - Review Perimeter protection, Fall Protection and Recovery
  - Review Skylight Protection
  - Review PPE, Ladder, and SDS requirements.
  - Review Daily Safety (JHA) Huddles and Daily Safety Inspections requirements.
  - Confirm underdeck inspection was completed (review photos)
  - Review Deck replacement requirements
  - Review Emergency Response Plan

- **Technical Review:**
  - Review with field supervision to ensure the technical scope (e.g., manufacturer and FM) requirements are fully understood.
  - Review Specifications, Drawings, Details, and Submittals
  - Roof products, roof assembly, and details (e.g., curbs, flashings, and other details)
  - Local code and Global FM requirements
  - Technical Transmittals

- **Pre-Construction Meeting & Client Expectations:**
  - Pre-Construction Meeting
  - Transmittals
  - General Correspondence
  - Reporting requirements
  - Security
  - Notifications

- **Production Expectations:**
  - Review (gridded) Roof Plan to confirm daily production expectations.
  - Review Material loading plan, dumpster, and parking locations
  - Review Workflow Daily script – Who starts where, doing what.
  - Review Man-power requirements
  - Review Equipment requirements
  - Review Pre-fabrication items, etc.
    - Review Subcontractor requirements
    - Discuss the need to document damages by other trades.

- **Production Reporting:**
  - Mark-up roof plan (visual schedule) with daily progress
  - Review Production Reporting processes (Quantities, Photos, Weather, Issues)

- **Project Schedules:**
  - Review Project Contract Milestones
  - Review Material Delivery Schedule
  - Review Weekly Production Goals
  - Discuss how many workdays are required to complete project.

- **Change Management:**
  - Review Change Order process (of submitting to client)
  - Review Project Forms, such as RFI, Change Orders, Transmittal Forms

- **Project Communication**
  - Review client and internal communication requirements and frequency

- **Quality Assurance:**
  - Review Quality Assurance review program (night tie-ins, seam welds, etc.)
  - Daily and Weekly QA reporting (with Operations)

- **Roof Top Risk Mitigation:**
  - Deck Inspection and Acceptance
  - Water Infiltration
  - Review nightly tie-ins,
  - Material and equipment storage
  - Fire watch, remove flammable materials.
  - Limit Roof Access (Owner, GC, Consultant)
  - Chemical, Electrical, and Asbestos Hazards

- **Approved Subcontractors**
  - Prequalification
  - Subcontracts

- **Project Costing and Accounting:**
  - Job Set-up form (completed) internal.
  - Project Progress Billing Process
  - Lien Release Process (include Stamp)
  - Revise Project Budgets (Revenue and Costs)
  - Job Cost reports - weekly / monthly
  - Per Diem and Lodging payments
  - Cash Flow Plan
    - Invoicing requirements
    - Vendor and Subcontractor Payments
    - Review process for matching Purchase Order with Invoice and Bill of Lading

- **Project Close-Out:**
  - Substantial Completion Form
  - Warranty
  - As-Built Drawings
  - Final Payment
  - Final Cost Analysis

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Project Information

Project Information consists of the documents and forms about the job. The Project Manager (PM) collects the documents and forms and creates electronic and paper files (if needed) to record the project. The documents and forms become project archives.

Documents for Project Initiation / Hand-Off

✓	Contract	✓	Estimate	✓	Manufacturer Pricing	✓	Proposal
✓	Specifications	✓	Bid Incl/Exclusions	✓	Vendor Pricing	✓	Scope of Work
✓	Addenda	✓	Correspondence	✓	Supplier Pricing	✓	Manufacturer System
✓	COI	✓	Bid Bond	✓	Equipment Pricing	✓	Manufacturer Details

The Project Manager will begin to formulate the "Ws": Who, When, Where, How and What.

Who are the project participants?

Owners Representative for Project

- Consultant on Project
- Architect on Project
- Property Manager

Internal Contractor Personnel

- Salesperson
- Other Contacts

When does the Project need to start and be completed?

- Project Start/Complete – Per Contract.
- Weather Delays – How to Request additional time?
- When is the project considered Substantially Complete?

Where is the project located?

- Industry or Governmental Regulations Required
- Permitting City, County – Requirements of Local Permitting Authority
- Local Building Codes
- Local Restraints on Construction, such as noise ordinances
- State Roofing Contractor License Requirements

How external factors may impact the project?

- Market Conditions – Material Delays, etc.
- Labor Conditions – Capacity
- Weather – Northern Geography in Winter, Southeastern Coastal during Hurricane season, etc.

What factors make the Project Successful?

- High Level Risks – data center, what is under roof? (Interior Protection)
- Historical Information on Client, Property, Like Projects, Other Feedback on Similar Project with Client

Scope of Work

The PM will request the hand-off package from estimating.

- Estimate
- Scope of Work
- Client Specifications
- Proposal
- Material List
- Duration
- Days
- Permitting Information
- Internal Crew Utilized
- Subcontractor Labor Amount
- Manufacturer Specifications
- Detail Drawings
- Measurements, etc.
- Determine full scope of work

Identify and Assign Project Team

When deciding on a Project Team, consider the following:

- Site Logistics: Single building, single roof section, multiple buildings
- Physical Size: Multiple Story Building, Square feet
- Site Complexities: Adjacent buildings, Amount of contact with Public (shopping center)
- Project Complexity: Warehouse, medical building, Data Center
- Contract Type: Contract Complexities, Such as Amount of Reporting
- Contract Risk: Liquidated damages, Unique penalties
- Roofing Material Contracted: Crews expertise with installing that material type.

Allocate Internal Crew or Approved Subcontractor	Training Required? Review with Subcontractor.
● Contact for Project ● Contract for Project with Approved Subcontractor	● Safety Training ● Roof System Application Training ● Client Specific Training, Prior to Going On-Site ● Equipment Training

Certificate of Insurance

- Request Your COI for the Client
- Request COI from the Subcontractor's Insurance Carrier for the Project

Client Contract Forms

Be aware of Client contract forms that will replace your standardized forms. Client forms may be required for invoicing. Specific Change Order forms may be required, as well as other forms to manage the project. The forms will be a part of the contract or provided at the pre-construction meeting.



DEFINE SCOPE

Create Work Breakdown Structure (WBS)

Define Scope – Detailed Description of the Project

Document SOW

- Project Deliverables
- What is considered complete?
- Project Exclusions
- Set Stakeholders Expectations
- Project Constraints
- Pre-Defined Completion Date
- Pre-Defined Budget
- Milestones for Project
- Contractual Provisions

Create / Work Breakdown Structure (WBS)

- WBS can be Scheduled, cost estimated, monitored, job costs entered and controlled
- Subdivide Project into Smaller Components, such as:
  - Project Mobilization, Safety Set-up
  - Roofing
  - Sheet Metal
  - De-Mobilization
- **Output from WBS**
  - Sub-divided Description of Work
  - Personnel Accountable for Work
  - Milestones
  - Associated Scheduled Activities
- Resources Required for WBS
- Human Resource Plan
  - Organization Chart – Roles, Responsibility, Authority
  - (Skill Set)
  - Superintendent
  - Foreman
  - Crew members
- Vehicle / Equipment Plan (Procurement Required?)
  - Crane / Other Equipment
  - On-Going Maintenance Costs Incurred by Procurement
  - Capital Expense?
  - Tools Required

- Cost Estimates
- Quality Requirements
- Acceptance Criteria
- Creates SOW BASELINE
- Verify Scope with Client/Consultant/Architect/Internal Personnel
- Ensure that SOW is complete
- Revise Baseline as needed

Define Activities of WBS

- Provide basis for scheduling, executing, monitoring and controlling the project work.
- Additional smaller milestones can be established from the activities
- Sequence Activities
  - Precedence
  - Dependency
  - Leads and Lags

Estimate Activity Resources

- Material
- People
- Equipment
- Supplies
- Create a Calendar of dates

Estimate Activity Durations – dependencies and interactions among the tasks

- Develop Schedule / Project Sequence
- Critical Path
- Production Plan
- Reports: Milestone Chart, GANTT Chart, Bar Charts
- PROJECT SCHEDULE BECOMES BASELINE

PROJECT SAFETY

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The contractor's commitment to education, investment in safety equipment, and project site inspections creates the safety culture. Focus on the human costs of accidents, by recognizing that your employees (and their families) are entitled to a work environment which is free from hazards and exposures.

A Contractor has a moral, economic, and legal obligation to ensure that the projects are safe.



Project Safety Expectations

Safety planning starts before Day 1 of work at the job site. Contractors take great pride in a consistent record of safety. There is no other aspect of the work that takes on greater priority.

A sample of Project Safety Expectations are:

- Provide safe working environments and conduct all company activities in a manner that reduces risk to all workers.
- Maintain all office, equipment, and jobsite conditions in ways that eliminate risk to visitors and the public and eliminate risk of damage to property and equipment.
- Provide safe, well-maintained equipment, proper training for all equipment operators, and instruction on safe methods and procedures.
- Comply with all federal, state, and local laws and regulations as they apply to all work performed.
- Never accept any unsafe working conditions for any reason and take immediate corrective action.

Expect that each worker:

- Will be responsible for safety and health.
- Use all safety equipment issued.
- Do not damage, remove, alter, or abuse safety equipment.
- Do not use safety equipment if it is in poor condition.
- Workers must be familiar with and observe all safety rules, procedures, and policies, as they may change from time to time.
- Supervisors enforce rules and procedures by their crews and immediately provide appropriate corrective measures when violations are observed.

- **The Project Manager will:**
  - Plan work in accordance with safety requirements
  - Provide safety information to all personnel and subcontractors

- **The Subcontractors will:**
  - Plan that all work will be performed in accordance with established safety regulations.
  - Assist in the preparation of the Site-Specific Safety Plan
  - Establish and maintain all job site notices/warning signs
  - Conduct regular inspections and review daily inspections
  - Coordinate emergency first aid, medical and fire protection at the job site
  - Ensure that proper PPE is provided and in working order
  - Require conformance to safety standards
  - Be aware of all safety requirements and safe working practices
  - Instruct new employees and existing employees performing new tasks in safe working practices
  - Conduct Daily Job Hazard assessment, inspection, and job huddle
  - Act immediately to correct any hazard, including unsafe acts and conditions that are within the scope of your crews' work
  - Immediately report all actual, perceived, or alleged safety violations



Project Safety Requirements

Fully implement the contractors Safety program on every project. OSHA is the federal government's regulator of safety rules.

The most frequently cited OSHA violations for the Roofing Industry are the following:

1. Fall Protection, construction (29 CFR 1926.501)
2. Hazard Communication standard, general industry (29 CFR 1910.1200)
3. Scaffolding, general requirements, construction (29 CFR 1926.451)
4. Respiratory protection, general industry (29 CFR 1910.134)
5. Control of hazardous energy (lockout/tag out), general industry (29 CFR 1910.147)
6. Powered Industrial trucks, general industry (29 CFR 1910.178)
7. Electrical, wiring methods, components, and equipment, general industry (29 CFR 1910.305)
8. Ladders, construction (29CFR 1925.1053)
9. Machines, general requirements, general industry (29 CFR 1910.212)
10. Electrical systems design, general requirements, general industry (29 CFR 1910.303)

- **Full compliance to Safety is recommended:**
- Fall, Perimeter, & Skylight protection, Ladder safety, SDS, PPE, and Electrical safety
- Site Specific Safety Plan
- Pre-Construction Inspection
- Placement of Safety Posters, etc.
- Daily Job Hazard Reviews (Daily Safety Huddles) with the entire crew
- Daily and Weekly Project Inspection document and reporting requirements

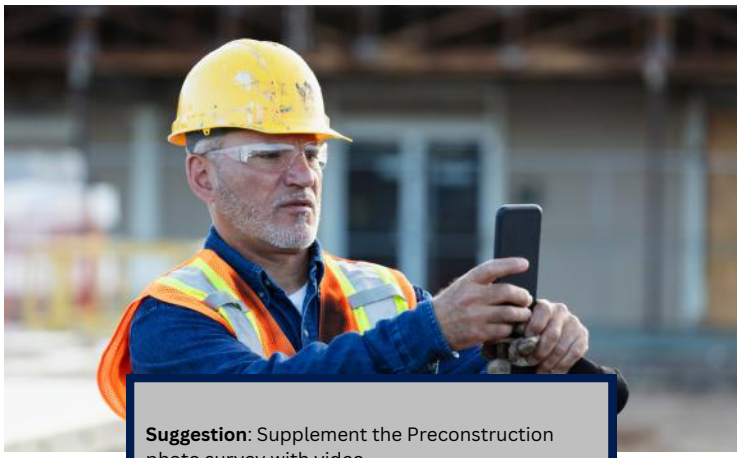
Prior to Mobilization

- **Aerial Overview of Site with at minimum the following added:**
  - Electrical Lines – Do any need to be removed or turned off prior to work?
  - Gas Lines, Ammonia Lines, Duct Work on Roof….
  - Roof Perimeter Protection, where and what type.
  - Skylight Protection
  - Ladder Placement
  - Crane/Equipment Placement
  - Dumpster Placement and Perimeter Flags placement
  - Placement of Signs
- Project Description
- Site Description and Waste Characteristics
- Hazard Evaluation
  - Chemical Hazards
  - Physical Hazards
- Safety Hazard Analysis
- Personal Protective Equipment
- Site Security and Control
- Emergency Response Plan

Mobilization

Pre-Construction Inspection Completed

- **Photos Required:**
  - **Under Deck Inspection!!!**
  - Landscaping
  - Building Façade
  - Parking Lot (potholes)
  - Existing Building Interior Damage
  - Building Equipment on Ground Next to Building
  - Signs
  - Any Other Pre-Existing Site Conditions
  - Skylights
  - Condition of Existing Rooftop Equipment (air handlers, exhaust fans)
  - Condition of Rooftop Conduit (electrical), Condensate Lines
  - Condition of Existing Roof Drains, Functioning? Damage?
  - Non-Penetrating Roof Top Projections: Satellite Dish, Antennae, Curbs, Sleepers, Pipe Supports, Equipment Platforms
  - Roof Top Projections: Plumbing Vents, Drains, Curbs, Vents, Pitch Pockets, Scuppers



Suggestion: Supplement the Preconstruction photo survey with video.
Preconstruction Video Tips:
Walk slowly and hold the camera steady.
Proceed along a planned route.
Narrate.
Describe each view.

Capture with Photos the Safety Set-Up at the site. Fully document the execution of the Safety Plan in Each Day's Report.

With perimeter protection installation, the crew is required to wear harnesses and be tied off.

The minimum photos required:

- Ladder Safety – Two photos.
- Perimeter Protection or Fall Arrest System – Two photos.
- Dumpster location and flags – 2 photos.
- Skylight protection – 2 photos.
- Roof Access – Hatch - 1 photo.
- Pedestrian Walkway – Two photos.
- Housekeeping - Two photos.
- Other Hazards – photo as needed.

During Production Work

During production, the subcontractor's supervisor, superintendent, or project manager will conduct daily **Job Hazard huddles before the construction starts for that day.**

- Discuss Site Specific Safety Plan
- Provide new information
- Review housekeeping
- Review stored material
- Review equipment
- Remind about proper PPE
- Discuss specific safety items for the day (subcontractor on site), client visit

Work Completed

- The last item to be removed is the perimeter protection. Crew to wear harnesses with Perimeter protection disassembly.
- Warning signs are removed after the equipment/dumpster is removed.
- Photo Documentation of site conditions after work is completed.



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TECHNICAL REVIEW

Verification of the estimate is critical for all construction projects.
In the case of some projects, an additional site visit will be required to reassess the conditions and secure measurements, required flashings, size of scuppers, penetrations, accessories, etc.

The project must be completed to the contract project specification and to the estimate to control costs on the job and to execute the contracted work.

Key elements for review:

- Specifications, Drawings, Details, and Submittals
- Roof products, roof assembly, and details (e.g., curbs, flashings, and other details)
- Local code and Global FM requirements
- Project Scope
- Hours
- Hotels/Per diem
- Equipment

Typical Technical Submittals:

- SDS Sheets
- Building Code Requirements
- Manufacturer Details
- Sheet Metal Color Selection

Review Roof Material

- Review Manufacturer Material Specifications
- Obtain and Format SDS for Technical Submittal to Client, if Needed
- Are there Risks that require special PPE for Crew Members/Personnel or Guests on Site?

Register Warranty with Manufacturer

- Submit for Warranty through Manufacturer's Process
- Provide Data Required from Manufacturer. Secure (PIN or Other Code)
- Create a Print Screen of the Request or the PIN Number for future reference and documentation

Send Technical Submittals to External Clients

(Customers/Consultants/Architects)
Ensure that the Client approves the materials per the specification before material order is placed

PRE-CONSTRUCTION MEETING & Client Expectations

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Managing Client expectations is key throughout the project.
Document the pre-construction conversation and the client requirements concerning the process and documents required.



Preparation is required. Know the project. Prepare a document package for review with the Client. Ensure that all personnel that are needed in the conversation are present.

Document the meeting with notes.
Provide the client with the notes and documents after the meeting.

Start Strong

Review of the project Scope of Work

- Review Scope of Work and conditions of tenants, on-site employees in the building
  - Noise, fumes, parking, changes in entries due to construction
  - Any Asbestos? Any issues for on-site employees?
- Receive Confirmation of the scope of work
- Review Change Order Process

Safety Data Sheets

- Submit the Technical Data to the Client for approval
- Receive authorization to proceed with the products

Review the contract with the Owner:

- Establish the date when invoicing is to be submitted and determine if the client requires “pencil” copies for review before official submission.
- Review Unit Costing.
  - Review process for change orders related to unit costing (wet insulation/nailers)

- Review of Liquidated Damages. What actions are required to stop any liquidated damages from being charged back?
- Review subcontractors. Does the owner have a right to review and disqualify a sub?
- Determine contractual contact. Who is the Owner's Rep?
- Review hours of construction.
  - Any issues, noise ordinances/requirements or traffic patterns?

Punch list and Warranty Items

- Review the Process
- Review the Approvers

Outline of Discussion:

- Confirm On-site Contacts
- Emergency Contacts
- Confirm Schedule
- Safety Expectations
- Security of Site – Site Security Requirements
- Working Hours
- Weather Delays
- Scope of Work Review
- Roof Top Units
- Roof Top Equipment
- Color Selection
- Staging Areas

Documents:

- Fully Executed Contract
- Permit
- Pre-Construction Deck Inspection
- Photo documentation of Pre-existing Site Conditions:
- Building Exterior
- Building Interior
- Landscaping
- Parking Lot
- Existing Water Damage
- Signoff of SOW with Owner/Consultant/Architect – Owners Representative
- Safety - Review Safety Plan to Site Conditions
- Determine any additional Risks.
- Placement of Peripherals (dumpsters, port-a-lets, vehicles, signage, kettles)
- Housekeeping Plan
- Emergency Plan / Emergency Contacts

Provide General Client Submittals

From the contract, develop a List / Calendar of Client Submittals. The list will assist with ensuring that documentation is sent and received by the Client according to our contractual obligations. The list can be verified with the Client at the Pre-Construction Meeting.

Typical Submittals:

- Project Schedule
- Certificate of Insurance
- Bond
- Weekly Meeting Notes
- Lien Releases
- Invoicing
- Warranty(s)

PRODUCTION EXPECTATIONS

Planning the production is key to providing daily goals for the crew.

In this section, we:

- **Review Material loading plan, dumpster, and parking locations**
- **Review (gridded) Roof Plan to confirm daily production expectations.**
- **Review Workflow Daily script – *Who starts where, doing what.***
- **Review Man-power requirements**
- **Review the use of overtime as a productivity enhancer.**
- **Review Equipment requirements**
- **Review Pre-fabrication items, etc.**
- **Subcontractor expectations/requirements**
- **Document damages by other trades**



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PRODUCTION PLANNING

The Daily Script is an overview of the production and intermittent goals on the project. The Daily Script outlines the daily requirements and maximizes daily production. The daily script is how to impact the project daily to achieve the performance and schedule baseline goals.

- Plan each day's work from an Aerial Overview of the property.
- Determine the number of hours and calculate days.
- Determine the projected man hours per section.
- Determine the number of workers required.
- Develop a Work Schedule
  - Will you work four 10-hour days or five 8-hour days?
- Does the project allow for overtime? Consider the following for OT rationale:
  - Does overtime increase productivity?
  - Does overtime allow for fewer tie-ins?
  - Does overtime require less travel?
  - Does overtime use less material?
  - Can overtime be scheduled in advance?
  - Does overtime decrease the project risk?
- Determine the number of materials for each day.
- Determine if material can be pre-cut or prefabricated.
- Output: Create a Loading Blueprint.
- Transfer the lines to the roof. Spray-paint the areas for loading, for work to be completed each day, so the entire crew visualizes the plan.
- Measure and adjust crew production to the plan daily.

SAMPLE DAILY SCRIPT

DAILY SCRIPT														
PROJECT NAME:	XYZ WAREHOUSE													
TOTAL SQUARES:	500		WEEKLY GOAL:		250 SQUARES			PRODUCTION		10	NOT INC. LOADING Etc			
DAILY GOAL:	50	SQ.	# of CREW:		10			HRS. PER DAY:		8	HRS/WEEK:		40	
	6:30 AM	7:00	8:00	9:00	10:00	11:00	12:00	12:30	1:00	2:00	3:00	4:00	5:00	
HUDDLE & SAFETY	10													
LAY OUT INSULATION		5	5	5	5									
FASTEN INSULATION		3	3	3	3	3	3							
SET ROLLS IN PLACE		2	2											
LAY OUT ROLLS			0	2	2	2	2		0	0	0			
FASTEN ROLLS						3	3		3	3	3			
WELD SEAMS						1	1		1	1	1			
FLASH CURBS ETC.						1	1		2	2	2			
FLASH WALLS ETC.									2	2	2			
CLEAN UP SITE									2	2				
PREP FOR TOMORROW											2			
TOTAL	10	10	10	10	10	10	10	0	10	10	10	0	0	

The Daily Script

Plan daily production of each crew member to achieve the daily goal. Complete Details with the Field of Roof Production. Don't wait for details for another day. Spray paint the Completion line required for each day on the roof, so that the entire crew sees the goal for the day.

Note: Lunch may be staggered to continue production if it is safe to do so. Work on details while other crew members are on lunch.

Can work be prefabricated before getting to the job site?

- Sheet metal
- Crickets
- Drain Sumps
- Nailers
- Cut flashings
- Half sheets
- Fasteners
- Penetration Flashings
- Parapet Flashings
- Cut felts
- Is there unique work that can be done at the warehouse?

Case for Pre-Fabrication, From FMI:

On projects where prefabricated assemblies were used, the estimate of the impact on productivity improvement as a percentage is:

Less than a 5 percent INCREASE in Productivity = 17%

5 to 10 percent INCREASE in Productivity = 39%

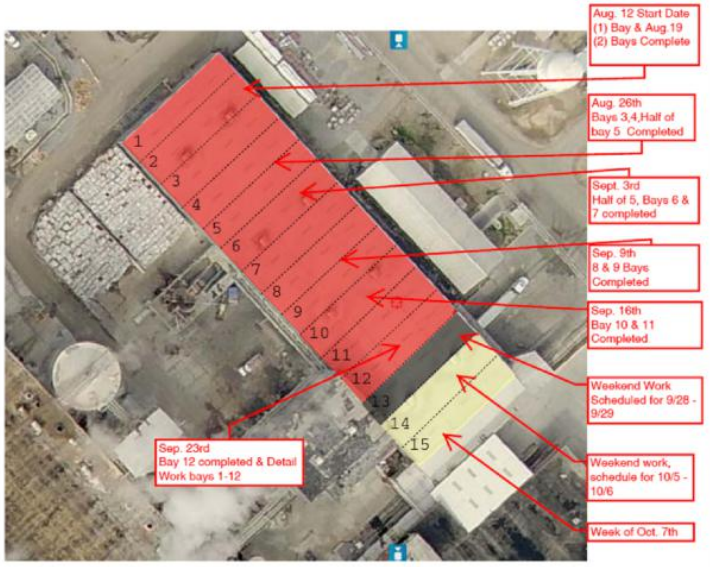
11 to 15 percent INCREASE in Productivity = 23%

16 to 20 percent INCREASE in Productivity = 13%

Greater than 25 percent INCREASE in Productivity = 7%

Equipment Plan – Resources can be scheduled, monitored, and controlled to reduce overall Costs:

Equipment	Type
Crane	
Man lift	40' 60' 80' 120' _____'
Sky Track	36' 44' 56'
Trailer - Storage	
Port a John	
Dumpster	
Roof Cutter	
Sweeper	
Gravel Spreader	
Generator	
Blower	
Varimat	
Fall Arrest System	
Perimeter Protection	



Loading/Production – Material Staging/Placement

- Plan the proper placement of material and equipment on the roof to increase production and decrease injuries.
- Use an Aerial Overview to determine placement.
  - Output is a Loading Blueprint

Sample Loading/Production Plan:

If you load materials here, they are adjacent to three work areas. Work sequence planning is required.

Work Area Day 4

Work Area Day 1

Work Area Day 3

Work Area Day 2

Note: Material access less than 25 feet results in claims decrease by 20%.



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PRODUCTION REPORTING

Production Reporting consists of two main areas that are reported EVERY DAY: Time collection and Production Reporting. The following are the key elements to review/create to determine if the schedule is on track:

Time Collection

For in-House crews, accurate reporting of labor is necessary to process payroll and to have actual costs applied to the project.

For planning reasons, the knowledge of where and how time is being spent on the project is important to be able to determine how many hours/days are left in the budget on the job compared to work that is still required to execute.

- Review and correct if necessary. Verify accuracy of time (on-site and commute time). Determine if field crews are achieving established goals, and, if not, discuss any issues with the field crews to solve any problems they may be experiencing that have led to the lack of productivity.
- Certified Payroll – Is it required?

Note: Time collection is important for your subcontractors also. Your overall cost may not change for the subcontractor. However, if the subcontractor is not on schedule other costs can increase such as equipment rental (forklifts, port-a-lets), overhead for managing the project longer than anticipated, and liquidated damages. Equipment and other resources for other jobs on the backlog may be delayed if the job completion is extended.

Production Reporting

Project team prepares Production Reports by detailing activities, accomplishments, milestones, identified issues, and problems. Performance reports provide key information of the following:

- Status – Planned vs. Actual
- Significant accomplishments for the period
- Scheduled activities
- Issues Addressed for the period
- Issues Open for the period

Production Reports are based on:

- Requirement of deadline
- Financial Information
- Issue and Defect Management
- Risk Control
- Field Daily Reports
- Issues Log

If used, daily reports detail what did (or did not) occur on a given day or throughout the project. A detailed history is prepared to be able to confirm the facts and performance of any given day. The daily reports become a key support in the defense of claims. The purpose of the reports is to:

- Provide a chronological, day-to-day account of the workforce, the respective activities planned, and the actual activities performed.
- Record all visitors to the site, with any significant comments.
- Provide easily retrievable weather information.
- Isolate specific work charged as a change order.
- Record materials and equipment being received on or sent from the site.
- Call attention to problems or situations.

It is important to understand that the greatest problem with Daily Reports is that the information in them is not needed until there is a problem, but then it is needed QUICKLY. The daily reports cannot be placed on the “back-burner” awaiting a slower day to catch up (once a week). When the information is compiled once a week, the details will be shortened (no time) or compromised (do not remember).

Daily Report Guidelines:

- Report all the facts.
- Report only facts. Frustrations and remarks made out of anger need to be responded to in person or through phone calls.
- Draw only appropriate conclusions (cause and effect relationships).
- Be brief – Yet be complete.
- Be precise. Provide specific location, specific number of square feet or linear feet.
- Bad: “reroofed” with no detail as to where, how much if details are completed, etc.
- If visitors are on site, state complete names.
- If a client or tenant has an issue, provide complete names and details for follow-up by other personnel.
- Include a report for every day. Workdays, weekends, holidays.
  - Workday – No work: Weather Delay. Rain at 60%
  - Workday – No work: No Work. Change Order 999 for insulation replacement has not been approved. Approval is required before work can proceed

- Workday – No work: No Work. Vac subcontractor is delayed. Work will not be done today
- Weekend: No Work scheduled. Saturday or Sunday. Work to begin again on Monday 99/99/9999 at 7:AM EST
- Holiday: No Work Scheduled. Christmas Day. Work to begin again on 12/26/9999 at 7:AM EST

The daily report must be filled out every day. Reports are compiled. If possible, use an electronic system to capture the data.

Typical Daily Report

Weather: Good, No Wind, Sunny
Supervision: Jim Jones (PM), Joe Jones (Superintendent), Jeff Jones (Foreman)
Crew: 4 Crew members
Hours: 8 hours
Safety: Inspection, Toolbox Talk
Visitors: None
Production: 300 LF of Gutter Removed and Installed
Tie In Method: Not Applicable
Tie In Status: Not Applicable
Planning: Material Staged
Comments: No Change Orders, No Delays
Short Falls in Production (Document Why)
Photos Taken:

- Roof Before, Tear Off and Installation of New Membrane (Overview Photos) (Minimum 4)
- Insulation Fastening Pattern (1 Photo)
- Membrane Fastening Pattern (1 Photo)
- Test Cuts for Single Ply Heat Weld (1 Photo)
- Finished Details (1 Photo Each)
- Roof Tie In (Minimum 2)
- Interior Walk for Debris/Damage (Interior Protection) (Minimum 2)
- Roof Drain Protection During Demolition (1 Photo Each Drain)
- Roof Drain Photo After Installation (1 Photo Each Drain)
- Snapshot of Weather Report (1 Photo)
- Safety Photos for the Day (Minimum 2)
- Aerial of Roof Progress

Capture the day's activities at the job site.
The following data and photos are captured:

- Weather
- Supervision, Crew, crew size, and hours worked
- Job Hazard Huddle, Inspection and Safety methods in place
- Production, Workmanship, Tie-In, production shortfalls documented
- Visitors any comments



Weather and weather delays impact the production schedule. Wind, Temperature, Snow and Rain all have an impact on the completion date.

Some Client contracts have liquidated damages (fines) for not completing a project by the contractual deadline.

The contracts have provisions for requesting additional time to complete the job due to unforeseen circumstances.

Documentation of the weather pattern on every day of the production is critical.

If the contract requires claims for weather delays to extend the complete date, a Change Order is required.

End of Day Checklist

At the end of each day, the Project Manager speaks to the Supervisor and reviews the outline below (at a minimum). The outline allows the contractor to be proactive concerning any issues before that the Client is aware of a potential problem.

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End of Day Checklist

Checklist with Crew Superintendent or Subcontractor at the end of the day prior to leaving the project site.

Checked-In with OnSite Contact			
Any Concerns:			
Schedule			
Daily Production Plan		Daily Production Completed	
Weather Issues?			
Crew is Meeting Production Plan?			
Quality Indicators			
Indicator	**Who Checked?**	**Action**	
SDS On-Site			
Water Infiltration?			
On-Site Visitors?			
Accidents/Incidents?			
Any Damages?			
Client Equipment Turned Off – Does it Need to Be Turned Back On?			
Tie-In Checked/Discussed			
Roof Drains Checked			
Deck Inspection			
TerminationsChecked			
SeamsTested			
Drains/Scuppers – Debris? Anything restricting water flow?			
Gutters Removed, what is the Drainage Plan?			
Housekeeping on Roof			
Housekeeping on Ground			
Ladders Removed?			
Adequate Material on Site?			
What Material Is Needed?			
How Is the Material Secured?			
Changes Requested			
Change Orders Required?			

PRODUCTIVITY IMPROVEMENT

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Productivity is the measurement of work accomplished with resources available. Productivity improvement is doing more work with little or no increase in resources (labor, money and/or time).

Factors Impacting Labor Productivity



- Project Design
- “Normal” or Unusual Contract Arrangements
- Local Climate
- Degree and Manner of Supervision
- Amount and Manner of Equipment Used
- Use of Technology
- Material Type and Availability
- Project Schedule and Organization (sequencing)
- Management Capacity
- Capacity and Competence of Crew or Subcontractor
- Site Layout
- Facility Layout
- Site Access

Expediting the Project

The need to expedite jobs is a daily part of the roofing industry.
Some techniques to assist in minimizing interruption to the workflow are the following:

- Do not start running in all directions at once. Sit down and gather the details. Remaining focused will be your greatest method of determining the best way of tackling the project.
- Use your experience from similar projects that have been successfully completed. Decide what needs to be completed and the deadline. Work backwards through the sequence of activities until you arrive at the first task.
- Determine which information or work will take the longest to collect or produce. Start working on these immediately. Even if it is out of sequence (secure permit, secure warranty, order specialized material).
- Once you determine all the steps, determine “how”. The most sensitive or difficult tasks need to be assigned to the most capable and reliable personnel. Know which parts of the process can tolerate various levels of quality.
- Whenever possible enlist other team members to assist with the administration of the project.
- Keep up the pressure on all team members.
- Maintain schedule and milestones. Ensure each milestone is achieved.
- Prepare yourself for new or unexpected problems. Expect the unexpected. Be innovative and demonstrate initiative.



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PROJECT SCHEDULES & RISKS

Clients depend on the accuracy of the Project Schedule. If the project falls behind schedule for any reason, clear communication in email and by telephone of the new start and complete dates is required.

The Client has risk when a contractor is working on their facility.

Risks include:

- Own employee injuries
- Guest injuries
- Vehicles in parking lots getting damaged
- Their equipment under the roof (data center/production line/food processing)
- Their production schedule for their goods/services
- Their facility (driveway, parking lot, landscaping, and building façade)
- Holiday constraints
- Slips and falls due to housekeeping or water infiltration

The Project Schedule is a visual display of the plan, gives an idea of anticipated cash flow, and is a record keeping device.

A Project Schedule must be done correctly and consistently because it:

- Provides an easily understood decision making tool to all team members.
- Provides the ability to define and track the project status.
- Provides the ability to monitor subcontractor's progress.
- Provides organization to the entire project team.

A Project Schedule is used to measure Project Performance and results.

- Project Contract Milestones (start/complete of activities)
- Material Delivery Schedule
- Review Weekly Production Goals
- Discuss how many workdays are required to complete the project.
- Determine resources for other projects.
- Determine critical path – what activities must be completed by a certain date to complete the project on time.

General Process of Creating a Project Schedule:

- The Project Manager will direct the development of the schedule and keep the schedule current.
- Review of activities to ensure that the detail, duration (number of days) and start and stop time are accurate.
- Involve Subcontractors as needed to develop the Project Schedule.
- Identify and consider the timing of all key items including:
  - Contract Start Date
  - Actual Project Start Date
  - Anticipated Shut Down Periods (holidays, Client specified)
  - Weather constraints
  - Characteristics of Major Components
  - Non-Standard Color of Metal
  - Custom Skylights
- Project Milestones, such as:
  - Weather constraints
  - Characteristics of Major Components
- Confirm Schedule with Project Team



If the Project Schedule Complete Date Exceeds the Contract Complete Date:

- Get out your pencil with the Project Team and determine how the schedule can be adjusted to meet the contract time
- Labor Not Available – Preferred Subcontractor not available. Select alternate Subcontractor and provide training and additional management, subcontract, and determine if contractual time frame can be extended
- Specified equipment is not available – rent equipment, borrow equipment
- Specified material is not available (timely) – Alternate material, alternate system acceptable by client, if not, extend contract complete date
- Unusual sequence, we do not have control over – Determine if we can change the sequence, if not, extend contract complete date

CHANGE MANAGEMENT

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Once the Project Plan is established, it can only be changed through Change Orders. Change Orders are used to document the changes on a project from the contract.



Conditions that Create Change Orders

Site work and site-related conditions account for most change order requests. These types of change orders deal with unforeseen subsurface conditions, or changed conditions can be complex. The complexity is due to the interpretation of what is considered “reasonable”. Delays can be created by waiting on approval for change orders and need to be documented, since the schedule is impacted. Lack of drawings or incomplete drawings or specifications may also delay the project and cause change orders.

Some of the potential issues that create change orders are listed below:

- **Errors and omissions in the contract documents -** Conflicts between small and large details in the written specifications and the drawings. Rework of work in place.
- **Unforeseen subsurface conditions**
- **Differing or changed conditions**
- **Drawing coordination problems -** Issues with multiple subcontractors and drawings for HVAC, roofing, and electrical do not match.
- **Delays in the construction process -** Excusable delays are important when there is a liquidated damages clause in the contract
- **Acceleration of the project when delays are over**
- **Winter conditions -** Time and material to remove snow
- **Requests to proceed with premium time work**
- **Latent conditions, hidden conditions**
- **Incomplete design**
- **Owner-generated changes**

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Change Order Process

Identify Change Order is required

Review the contract and scope of work

A Project Change Order is a result of the modification in any of the following:

- Project Policies/Procedures/Customer Requirements (security, safety)
- Project Scope (additions/deletions/modifications to SOW)
  Note: Be cautious of Scope Creep. Client requesting work that is not part of project.
  - Manufacturer
  - System
  - Membrane, Insulation thickness, Details
  - Add a canopy area or another small space.
  - Include repairs for other roof areas.
  - Fix a leak in another roof area.
- Project Cost
- Project Schedule. Note: Be cautious of documenting weather delays

Notify Client (in writing)

A Project Change Must Be Written.

- **May be initiated verbally.** Project Manager must provide in writing and receive approval back in writing.
- **Create Change Order in Proper Format –** Are Unit Costs involved?
- **Change Orders are logged to track open, approved and declined change orders.**
- **Change Orders are approved in writing**, who according to the contract is authorized to approve changes for the client?
- **Change Orders that are approved are scheduled with project team**
- **Change Orders may impact schedule or daily work plan and will need to be communicated**
- **Receive approval (in writing) -** Ensure that Change Orders are approved in writing. Your Accounting Department will need this documentation to be able to invoice and collect the funds from the client.
- **Proceed with work-** Once work is approved, communicate changes to the crew and retrieve photos through the Daily reports that the work is being executed.

All Change Orders must be kept as a record to ensure that the change has been approved before a change in cost or a change in schedule.

In the Daily Report, additional photos are required for special situations

"Before – During – After" photos are necessary involving actual or potential:

- **Change Orders**
- **Claims**
- **Back charges**
- **Insurance claims**
- **The "surprise du jour" – Surprise of the Day**
  A precondition photo or series of photos will be the best record to confirm the actual condition prior to an issue being discovered.



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PROJECT COMMUNICATION

Each project communication must be clear, concise, efficient, and focused. The information presented must be factual and the conclusions must be logical. Opinions must be minimal and emotional expressions must be controlled. Communication about the project needs to originate from one source – the Project Manager. It will eliminate duplicate correspondence and the Project Manager will consolidate the information for ease of the recipients.

Project Managers communicate with Clients, Field Employees, Accounting, and Management Personnel, sales personnel, and other team members.

For each Project, the Project Manager needs to determine:

- **What is to be communicated?**
- **Time frame and frequency of information**
- **Who is to receive the information?**
- **Client reports may include:**
  - Current Status of risks and issues
  - Work completed during the period
    - Planned vs. Actual
  - Work scheduled for next period.
  - Summary of Change Orders approved in the period.
  - Summary of Change Orders pending in the period
- **Internal Reports may include:**
  - All the above, and the following:
  - Project Completion Time
    - Planned vs. Actual
  - Project Completion Cost
    - Planned vs. Actual
  - Project Quality Issues
  - Additional Resources Required.

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Effective Communication:

- Every phone call that communicates a change in the project, approval or any other contractual requirements must be restated in writing.
- Keep each project separate in email – Don't lump issues with multiple projects into one email.
- **Confine the email subject to a single issue or to a small group of closely related issues.**
- **Use a consistent document format**
  - Email Subject: Client/Project Name/City, State – Project Number
  - First Line Reference: Contract Number – Contract Date
- **Single page, if possible**
  - Executive Summary
  - Bullet Points
- **Avoid redundancy**
- **Keep it simple**
  - If it isn't a simple topic, talk to the decision maker on the phone and then follow up with an email
- **Use cause-effect style**
  - Ensure that every word has a purpose
  - Do not jump around
  - Change long sentences to short and simple ones
  - Do not send correspondence without a call to action if the recipient needs something by a certain date
- **Stay factual**
  - Do not make assumptions, ask questions if you do not know the facts
  - A written document is not the place for emotion, sarcasm, or irrelevant criticism
  - Be professional
- **Avoid personal attack & stay cool**
  - Do not respond to a written letter in anger
  - Goal – RESOLVE the problem
- **Send document to the decision maker**
  - Respect the contract
  - Understand who has the authority to decide according to the contract. At the job site, tenants or other personnel may act like they are the decision maker, and they are not
- **Guide the decision**
  - Provide your solution and perhaps an alternative. If the alternate solution will not work, provide an explanation as to why it is not the correct choice.
- **Require specific action by a specific date**
  - Provide what will be the consequence if you do not have guidance/approval by a certain date
- **Follow-up / follow-through**

A Daily Report can be sent to the Client each day to document the progress and status of the project.

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QUALITY ASSURANCE

Quality Assurance includes not only the field operations and the actual construction workmanship, but also the estimating process, accounting process and all other documents and communication that are provided to the client.



The quality of the close out process is just as important as the quality of the job start. The close out paperwork and warranties need to be assembled and submitted promptly. Punchlist completed and signed off and lien waivers obtained from suppliers and subcontractors quickly.

Quality Control is the measures put in place by the Contractor to control the quality that's put into the project, such as: employee training, policies and procedures, construction methods, material, tools, etc.

Quality Assurance is a Quality Control Plan that audits the crew, procedures, quantity, timeliness, responsiveness, and customer satisfaction to the requirements of the Scope of Work.

Daily and Weekly QA reporting

- **Define the Goals: Determine Quality Requirements**
- **Measure Progress Towards Goals:**
  - Determine Metrics/Measurements Required to Monitor Quality for the Project
  - Determine the Standards for the Project
  - Determine How to Measure if the Project is Compliant with Client Requirements
  - Determine the Factors to Ensure that the Client will be Satisfied with the Outcome
- **Analyze issues between performance and objectives:** Work on preventing possible problems before they occur
- **Improve Process:** Modify Process to Achieve Results
- **Audit New Process:** Check to Ensure that New Process is working

Self-Perform – Inspection / Reviews / Audits / Walkthroughs:

- Determine defects in workmanship and implement corrective actions.
- Determine defects in planned details and implement corrective actions.
- Determine defects in material and implement corrective actions.
- Corrective action – Documented direction to move the project to the baseline.
- Preventive action – Documented direction to reduce the probability of negative impact on the baseline.
- Validate changes are made with photos and on-site inspections

Other Indicators of Workmanship that require Photo documentation are:

- **Consultant –** Determine Defects in Workmanship and provide a punch list
- **Manufacturer –** Determine Defects in Workmanship and provide a punch list

Validate Changes are Made by Photo Documentation and On-Site Visits

Review the daily work for any apparent issues. The daily report outline provides data for Quality reviews (highlighted in yellow). A typical daily report will have the following data for review:

Typical Daily Report

Weather: Good
Supervision: Jim Jones (PM), Joe Jones (Superintendent), Jeff Jones (Supervisor)
Crew: 6 crew members
Hours: 8 hours
Safety: Inspection, Toolbox Talk
Visitors: None
Production: 10,000 SF Removed and Installed
Tie In Status: Complete
Planning: Material Staged
Comments: No Change Orders, No Delays
Short Falls in Production (Document Why)
Photos Taken:

- Roof before, tear off and installation of new membrane (overview photos, minimum 4)
- Insulation fastening pattern (1 photo)
- Membrane fastening pattern (1 photo)
- Test cuts for Single Ply Heat Weld (1 photo)
- Finished details (1 photo each)
- Roof tie In (minimum 2)
- Interior walk for debris/damage (interior protection, minimum 2)
- Roof drain protection during demolition (1 photo Each Drain)
- Roof drain photo after Installation (1 photo Each Drain)
- Snapshot of Weather Report (1 photo)
- Safety photos for the day (minimum 2)
- Aerial snapshot of roof progress (from CORE at Review)



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ROOF TOP RISK MITIGATION

Contractor implements strategies of communication, training and planning to address the risk on the projects. Most risks involve weather, water intrusion, chemical issues, and safety. Reducing risks is an important function of Project Management.

Methods that Contractors use to mitigate risk are:

- Deck Inspection and Acceptance
- Water Infiltration Plans
- Reviewing nightly tie-ins, seam welds, flashings
- Material and equipment storage
- Fire watch, remove flammable materials.
- Limiting Roof Access (Owner, GC, Consultant)
- Understanding of Chemical, Electrical, and Asbestos Hazards
- Financial Risks

Methods to reduce risks include:

- **Avoid** – Eliminate threat entirely.
- **Transfer** – Type of threat is transferred to a third party.
- Contractually eliminate risk with subcontractor agreement (reduce employee exposure, such as asbestos abatement)
- **Mitigate** - Training, education, communication, planning
- **Manage** – What is the level of acceptable risk?

A strategy to reduce negative risks involves implementing solutions to problems before they exist.

A tool to identify risks, roles and responsibilities of the Project Team and allocating authority for decisions concerning risks on the job site is the Watch List.

Identify Risks, Such as:	Plan Risk Responses, Such as:
Unexpected weather emergencies	Monitor Weather, Emergency Tarps, Emergency Plan
Water Intrusion	**Water Infiltration Prevention Program** Training on Tie-In, Tie-In Plan
Deck Deterioration	Deck Inspection, Additional Safety Required
Sensitive Equipment Under Roof (Data Center/Manufacturing Equipment)	***Interior Protection Required for dust/debris?*** open communication with on-site personnel
Electric Conduit/Plumbing in Interior	Fastening patterns, emergency response
Asbestos Abatement Chemical Hazards (Ammonia lines on Roof)	Abatement Contractor or Completed in House. Abatement Plan, PPE, Schedule for Work
Regulators Visits (OSHA), other Agency	Emergency Plan with On-Site Personnel
Visits	Daily Safety Inspection

WATER INFILTRATION PREVENTION SAMPLE

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For High-Risk Roofs, provide risk mitigation policies to the roofing team. Such as the following:

Roof System Tear Off and Replacement:

- Do not tear-off with 20% or greater chance of rain
- Do not tear off the above sensitive equipment with a 10% or greater chance of rain

Overlay/Recover of Existing Roof System:

- Do not install an overlay roof system with a 20% or greater chance of rain
- Always roof so water runs away from tie in. Start on high areas and work towards the low side or drain areas

Task:	Roof Replacement at Sections 1
High Risk Area:	Section 1 - DATA CENTER
Moderate Risk Area:	
Analyzed by:	
Required Materials:	'Emergency' Polypropylene Tarps, TPO Membrane, Plastic Cement, Wood 2" x 4" Lumber, Low-Rise Foam, 'Weights'
Required/Recommended Trainings:	Temporary watertight tie ins, including appropriate materials and methods for site-specific conditions. Use of all 'technology' i.e.: Smart Phones, Tablets for weather satellite data and communicating relevant data.
Site Specific – Tear Off	Once the 2 layers of type VI felts are installed with hot asphalt, carefully inspect the plies for any voids or fish mouths, and immediately repair any deficiency found. If this work is performed over a switch area "GLAZE" the entire area with hot asphalt so that all unforeseen condition are closed.
Site Specific – Recover	Night tie-in must have 6" of the leading edge of the TPO membrane fully adhered to existing roof system with exposed caulking at the very edge of the TPO.

Task	Hazzards	Controls
• Removal of and disposal of existing roof and night "tie-in" of new roofing into 'existing roof' • Flashing of New Roof • Roof Detail Specifications	• Water Infiltration at night due to improper tie-in and risk in the day (from 'pop up' rainstorms) • Water Infiltration due to improper flashing details • Water Infiltration from improper nightly tie-ins and details	• Always be Aware of your surroundings and other tradesmen on the site, particularly tradesmen unfamiliar with roofing who may unknowingly cause damage/leak points. • Review weather forecast for risk and for 'unknown' pop up storms. • Look for hazards during demo such as falling items that may penetrate the roof and create an unknown water entry point. • Have a daily plan for temporary roof in deck replacement areas. • Review Water Infiltration Risk every morning as part of the daily safety. Confirm Emergency Materials are on-site. • Review Nightly Tie Ins.

NIGHT TIE-IN MENU

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Each Project requires a Night Tie-in process.
The specification is to be documented and to be communicated to the Crew.

Select the appropriate Night Tie In for the field supervisor to use.

Guidelines:

- The new roof is higher/taller than the old roof.
- Tie-in should never be in low area of roof or in an area, that has ponding issues.
- Tie in should not be backwater lapped.
- Never torch to wood fiber.
- Raise tie-in if possible.

Existing Roof	New Roof	Approved Tie-In
EPDM > EPDM Mod-Bit > Mod-Bit	EPDM > EPDM Mod-Bit > Mod-Bit	Traditional Seaming Method (Weight if needed)
TPO	TPO	Traditional seaming method (Verify two systems are compatible) Seam Tape and Strip if unable to weld
Mod Bit	Any New Roof System	Seam Tape and Strip
Mod Bit	Any New Roof System	Weld (hand weld)
Mod Bit	Any New Roof System	Hot Asphalt
Mod Bit	Any New Roof System	Pourable Sealer
BUR (spuds)	Any New Roof System	Hot Asphalt
BUR (spuds)	Any New Roof System	Pourable Sealer
BUR (won't spud))	Any New Roof System	Hot Asphalt
BUR (won't spud))	Any New Roof System	Pourable Sealer
Single Ply (not Ballasted)	Any Single Ply Torch, Mechanically Fastened, Cold Processed MOD	Seam Tape Hot Asphalt Pourable Sealer
Single Ply (Ballasted)	Any Single Ply Torch, Mechanically Fastened, Cold Processed MOD	Seam Tape Hot Asphalt Pourable Sealer
Other System	Other System	Tie-In must be approved by Manager



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SUBCONTRACTORS

Contractors are accountable for the work of Subcontractors on projects. As such, ensure by site visits and daily photo documentation that guidelines are being followed and the subcontractor is managed closely.

Approved Subcontractors need to be fully vetted.

When selecting a Subcontractor for use on a client's project:

- Assess for meeting baseline requirements of Contractor, contractor licenses, or other regulation.
- Technical capability of subcontractor
- Mitigate risk with subcontract.
- Warranty of subcontractor
- Financial capacity of subcontractor
- Production capacity of subcontractor
- Business size and type – WBE, Veterans for Reporting Requirements or Contractual Obligations
- Past Performance with Contractor
- References – Check References

If you have a subcontractor that is used on a regular basis for multiple projects, a Master Service Agreement and multiple POs would be issued. This step decreases paperwork.

When Sub-contracting a project, ensure that the following are on the contract agreement:

- Detailed Scope of Work of Subcontractor
- Schedule (start/stop, duration, weather delays)
- Performance reporting
- Roles and responsibilities
- Pricing (any unit costing, alternates, extra work)
- Change Orders – How, When to be communicated?
- Payment terms
- Inspection and acceptance criteria
- Warranty
- Limitation of liability
- Insurance/Performance bonds
- Subordinate subcontractor approvals
- COI – naming Contractor and affiliates as additional insured
- Submittal package required back from subcontractor, what is required back based upon contractual obligations for submittals?
- Project Plan
- Project Schedule

The Subcontractor must provide written communication daily on the project with photo documentation.

JOB COSTING AND ACCOUNTING

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Project Costing and Accounting begins with a Job Set-Up Form and entering the data into your accounting system. Attempt to not incur Costs on a project until the Job Cost record is created, so that all costs and expenses on a project can be allocated to the correct job.

The Project Manager and Operations Department

Assists in monitoring cost performance, verifying cost information, maintaining appropriate records, and reporting job-costing issues.

Responsibilities include:

- Establishing all files relating to contracts, billings, payroll and labor records and material costs.
- Maintaining job cost information on a current basis
- Enforcing compliance with payroll and time reporting with Field employees
- Securing lien waivers from vendors, suppliers, and subcontractors
- Report job costing information, as needed.

Cash Flow

One of the most important aspects of Project Management is cash flow. To assist with cash flow the project management team plans the following:

- **Invoices to Client**
- **Work Schedule**
- **Equipment Delivery**
- **Material Ordering**
- **Approved Overtime**
- **Commute Time and Per Diem**
- **Schedule Away at Project and At Home for Lodging Payments**



Procurement

Materials and equipment rentals need to be ordered timely to not slow production, but not too soon to jeopardize cash flow.

Identify: Vendors, Subcontractors, Suppliers

- **Vendors:** Select Vendors for Waste Management, Equipment Rental, Port-A-Let, etc.
- **Subcontractors:** Labor, Labor and Material, Vacuum
- **Suppliers:** Select Manufacturer for Roof System, if applicable and not a contractual stipulation. Review contract for authorized manufacturers. Determine how to purchase -through a Distributor or Direct from Manufacturers. Review incentive programs for order placement.

Track and record Purchase Orders through a Purchase Order log

- A consideration in the procurement process is on purchasing of specialty orders and the associated lead times. Items such as roof hatches, skylights, custom or limited stock colors and/or, Items requiring extended fabrication times need to be planned. Any extended time frame for procurement and/or fabrication needs to be figured into the scheduling of the job, as well as communicated to the customer.

Job Cost Reports

Accounting needs data from Estimating and Operations to enter data into Job Cost reporting:

Capture direct costs associated with Project.

- Labor
- Material
- Vendors
- Suppliers
- Subcontractors
- Regulatory
- Payment and Performance Bond
- Taxes

Document to Accounting the following:

- Basis for Budget
- Assumptions Made
- Known Constraints
- Range of Budget if it is +/- a % based upon unknown factors.
- Indication of Confidence of Budgeted Numbers

The Project Management team may also need to provide Schedule of Values– AIA G703 SOV.

The Schedule of Values may be required by the Client prior to project start.

It is suggested for invoicing and collection of funds to have the descriptions of work be general and not too detailed. Such as “Labor”, instead of “Install Coping Cap”. Alternatively, “Material”, instead of “3.3-inch polyisocyanurate insulation”.



If a client requires a detailed job breakdown, more administration time will be required of the Project Manager to determine the percentage complete for accounting to be able to invoice.



Change Orders are added to the Schedule of Values when approved. If Change Orders are added before approved by the client, the client will hold up payment of the entire invoice. Unapproved change orders that are invoiced with monthly submittals will hold up payment from the Client and will affect the project’s cash flow.



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CONTROL COSTS

To control costs, the Project Manager reviews the Job Costing Reports to determine:

- **Level of Accuracy of Data**
  - How current?
  - When decision is made to purchase additional material – Purchase Orders Created
  - When Material is Delivered
  - When Equipment is Delivered
  - When Actual Cost is Incurred – Placed into Account Payable
  - All Data is Captured
- Ensure all change orders are acted on in a timely manner
- Manage the change orders as they occur



- Manage the delivery of materials. Ensure that material deliveries are not short shipped by counting the material on each delivery. If they are short shipped, work with the vendor immediately to receive the material. Otherwise, the crew may be on the clock with no material.
- Manage Subcontractors Costs. Any associated cost increases by a Subcontractor are passed on quickly to Client and approved before paid to a Subcontractor or invoiced to Client.
- Monitor Work Performance / LABOR against estimated labor.
- Prevent unapproved changes from being included in Work or Costs added to project that are not approved.

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PROJECT CLOSE-OUT

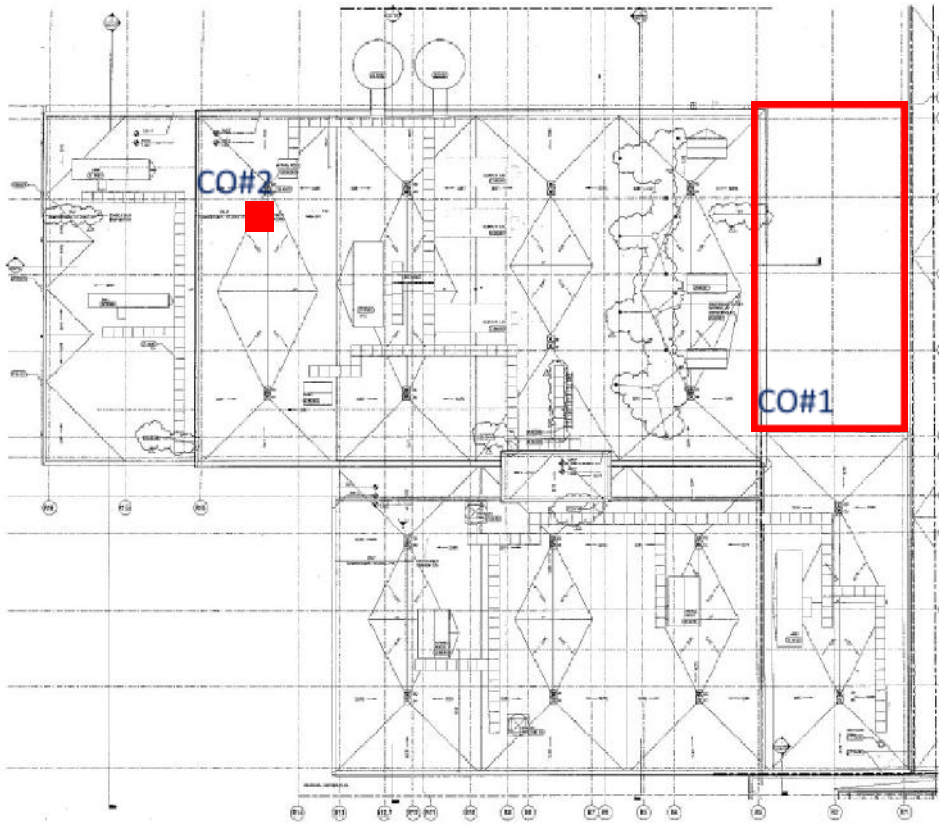
A successful project is not complete until it is Closed Out. The Close Out process involves ensuring that every requirement has been met, the site has been demobilized, the warranty(s) have been issued, and all the accounting actions are completed. The most important part in this section is documenting lessons learned.

As-Built Drawings

The purpose of As-Built drawings is for a permanent record for the building Owner regarding all actual conditions relative to those originally designed. The drawings note dimensional deviations and consolidate the modifications that have occurred through the construction period. The information is used to aid in future design, construction, and maintenance.

Procedure:

- Capture a clean set of the plans and drawings.
- Record detail changes in red ink, dated, change order number, throughout project.
- At the project end, provide a set of the drawings with the related changes.



Change Order #1:
Additional Square Feet

Change Order #2:
Additional Roof Hatch

Project Demobilization

- Completed Photos of Roof, details, housekeeping.
- Photos of building conditions, landscaping, exterior of building at project close out
- Final equipment pick-up (dumpsters, port-a-lets)
- The last item disassembled is Perimeter Protection. Crew wears safety harnesses while the perimeter protection is removed.
- Material left-over is picked up.

Documents Close-Out

- **Record Retention According to Contract**
- **Close Out Vendor Accounts Payable**
  - Audit as needed
- **Close Out Supplier Accounts Payable**
  - Audit as needed
- **Close Out Subcontractor Accounts Payable**
  - Audit
- Completed Internal Punch List Before and After Photos
- Completed Consultant Punch List Before and After Photos
- Completed Architect Punch List Before and After Photos
- Completed Client Punch List Before and After Photos
- **Manufacturer Warranty**
  - Filed
  - Sent to Client
- **Project Files Closed Out**
- **Report Card for Crew**

Post Job Review Agenda/Checklist

- **Close out meeting**
  - Review with Project Team – Expectations of Project Met?
  - Review with Estimator – Estimate to Final Project Measurements
- **Lessons Learned Documented**
  - Production Schedule
  - Scope of Work
  - Cost Control

ROOFING PROJECT MANAGEMENT GUIDE

PROJECT INITIATION / HAND-OFF

General Project Information			
Property			
Address			
City, ST Zip			
Project Initiation Date PM		Owner	
Assigned		Owner's	
Estimator		Representative	
National Account?		Consultant	
National Account Mgr		Property Manager	
Contract Schedule		Architect	
Start, per Contract		**Complete**, per Contract	
Weather Delays, Process to Request Additional Time:			
When is the project Substantially Complete, per contract?			
Bonding / Insurance			
Bonded Project (Yes) (No)			
Insurance (OCIP) (CCIP) Other, Non-Standard Insurance Coverage Required:			
Governmental Factors			
State Roofing Contractor Requirements			
State Roofing Contractor License (Copy)			
Permit:CityorCounty (LocalBuildingCodes–Concerns?)			
Legal Property Description/Address:			
Local Regulations on Construction, such as Noise Ordinances			
Market Conditions			
Material – delays, due to demand, severe weather, stock			
Labor – harmony issues, local, site, region			
High Level Risks			
Client or Property High Level Risks. What is on or under the roof (roof protecting)? (Data Center, Food Processing, Electrical Equipment, Microwave dishes, satellite dishes, electrical conduit….			

Documents for Project Initiation / Hand-Off							
	Contract		Estimate (Edge)		Manuf Pricing		Proposal
	Specification Book		Bid Incl/Exclusions		Vendor Pricing		Scope of Work Manuf
	Addenda		Correspondence		Supplier Pricing		Details
	COI						

ROOFING PROJECT MANAGEMENT GUIDE

PRE-JOB PLANNING

1. Project Information	
Discussion	**Action Items**
2. Safety Requirements	
Discussion	**Action Items**
3. Technical Review	
Discussion	**Action Items**
4. Client Expectations	
Discussion	**Action Items**
5. Production Expectations	
Discussion	**Action Items**
6. Production Reporting	
Discussion	**Action Items**
7. Project Schedules	
Discussion	**Action Items**
8. Change Management	
Discussion	**Action Items**
9. Project Communication	
Discussion	**Action Items**

PRE-JOB PLANNING

10. Quality Assurance	
Discussion	**Action Items**
11. Risk Mitigation	
Discussion	**Action Items**
12. Sub-Contractors	
Discussion	**Action Items**
13. Job Costing and Accounting	
Discussion	**Action Items**
14. Project Close Out	
Discussion	**Action Items**
Other Discussion Points	
Discussion	**Action Items**

ROOFING PROJECT MANAGEMENT GUIDE

PRE-CONSTRUCTION MEETING AGENDA

Pre-Construction Meeting Agenda

Property Name
Property Address
Property City, ST Zip

Date:
Time:
Location:

Participants
Client: Name, email, mobile phone Contractor: Name, email, mobile phone

Meeting Discussion Points and Deliverables	
Key Contacts	
On-Site:	Name, Mobile
Contractor Operations:	City, ST Office Office Phone: Office Fax: Safety Manager Safety Manager, Mobile Phone Project Operations Contacts: Project Manager, Mobile Phone Superintendent, Mobile Phone Supervisor, Mobile Phone
Schedule	Start: Complete:

Safety	
Discussion	**Action Items**
Contractor Commitment to Safety	
SDS Sheets	
Asbestos Abatement: No ACM	
Emergency Contact Numbers	

Roof- Edge Fall Protection	
Hot Work Requirements / Fire System	
Impairment Site Specific Concerns • Environmental Issues	
All accidents/incidents reported immediately	
Other Items Discussed Under Safety:	
Security	
Discussion	Action Items
Access to roof – by ladder on outside of bldg.	
Other Items Discussed Under Security:	
General Project Overview	
Discussion	Action Items
Facility Hours	
Working Hours – 6:AM to 6:PM Weekdays	
Weekend work? Monday through Saturday Schedule. Sunday for Weather Make-Up Days.	
Project Schedule	
Project Description (Overview Scope of Work)	
Building Sign	
Skylights	
Satellite	
Gas Lines Raised	
Metal Colors	
Interior Protection = NONE	
Staging area for crane, dumpster, materials –	
Construction debris / housekeeping – Clean at end of each shift	
Progress Meetings – Weekly update once started.	
Port A Let required.	
Roofing Contractors – Proper attire	
Other Items Discussed Under General Project Overview:	

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FINAL QUALITY & ON-SITE INSPECTION CHECKLIST

General Project Information			
Property		Date of Site Visit:	
Address		Is this a ***Re-Check***	
City, ST Zip		Visit? Project Manager:	
Project Number		PM Initials	
Checked-In with On-Site Contact			
Notes:			
Schedule			
Start per BASELINE		**Complete per BASELINE**	
Start – ACTUAL		**Complete - ACTUAL**	
Scope of Work			
Observation	**Action Item**	**Accountable**	**Re-Check Date**
Housekeeping on Roof			
Housekeeping on Ground			
Material Removed			
Equipment Removed			
Safety Removed			
Membrane Fastening			
Membrane Adhesion			
Wall Flashings			
Curb Flashings			
Penetration Flashings			
Corners			
Terminations Checked			
Seams Tested			
Sheet Metal Installation			
Drainage Checked			
Gutters			
Scuppers			
Drains			
Water Infiltration?			
Inspections	**Scheduled**	**Date**	**Punch List Completed By**
Manufacturers Inspection			
Consultant's Inspection			
Local Building Inspection			
Other External Inspection			
Changes Documented and Approved			
Unapproved Change Orders	**Action**	**Accountability**	**Re-Check Date**

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PROJECT DE-MOBILIZATION CHECKLIST

General Project Information			
Property		Superintendent/Supervisor	
Address		Superintendent Initials	
City, ST Zip		Project Manager:	
Project Number		PM Initials	
Checked-In with On-Site Contact			
Notes:			

Action Item	Who	When	Complete
Housekeeping - Roof			
Housekeeping - Inside			
Housekeeping - Staging			
Housekeeping – Parking Lot			
Housekeeping – Dumpster			
Remove Interior Protection			
Pick Up Left-Over Material			
Pick Up Equipment			
Remove Safety Set-Up			
Return Rental Equipment			
Return Dumpster			
Return Port-A-Let			
Site Photos – Landscaping			
Site Photos – Building			
Site Photos – Roof			
Site Photos – Parking Lot			
Return Building Keys			
Return Gate Keys			
Exchange Gate Lock			

DOCUMENTS CLOSE-OUT

ROOFING PROJECT MANAGEMENT GUIDE

General Project Information			
Property		Project Manager:	
Address		PM Initials	
City, ST Zip			
Project Number			
Notes:			

Document Process	Action Items	Follow Up	Complete
Record Retention According to Contract			
Vendor Accounts Payable			
Supplier Accounts Payable			
Subcontractor Accounts Payable			
Change Orders			
Purchase Orders			
Claims			
Punch List – Contractor			
Punch List – Consultant			
Punch List – Architect			
Punch List – Client			
Punch List – Manufacturer			
Manufacturer Warranty			
Report Card for Crew			
Other Documents:			

POST PROJECT MEETING

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Property Name
Property Address
Property City, ST Zip

Date:
Time:
Location:

	Meeting Discussion Points and Deliverables		
	Contractor Operations:	City,STOffice Office Phone: Office Fax: Safety Manager Safety Manager, Mobile Phone Project Operations Contacts: Project Manager, Mobile Phone Superintendent, Mobile Phone Supervisor, Mobile Phone	
	Project Schedule	Start: Complete:	

1. Project Information	
Discussion	*Lessons Learned*
2. Safety Requirements	
Discussion	*Lessons Learned*
3. Technical Review	
Discussion	*Lessons Learned*
4. Client Expectations	
Discussion	*Lessons Learned*
5. Production Expectations	
Discussion	*Lessons Learned*

6. Production Reporting	
Discussion	*Lessons Learned*
7. Project Schedules	
Discussion	*Lessons Learned*
8. Change Management	
Discussion	*Lessons Learned*
9. Project Communication	
Discussion	*Lessons Learned*
10. Quality Assurance	
Discussion	*Lessons Learned*
11. Risk Mitigation	
Discussion	*Lessons Learned*
12. Subcontractors	
Discussion	*Lessons Learned*
13. Job Costing and Accounting	
Discussion	*Lessons Learned*
14. Project Close Out	
Discussion	*Lessons Learned*
Other Discussion Points	
Discussion	*Lessons Learned*



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EARNED VALUE

What is Earned Value?

Earned Value shows how much of the budget and time should have been spent, with regard to the amount of work done so far. Current performance is the best indicator of future performance, and therefore using trend data, it is possible to forecast cost or schedule overruns at an early stage in a project. The project manager needs to agree with the project scope, create a Work Breakdown Structure (WBS) and assign budget to each work package, the lowest level of the WBS. Next, he or she will create a schedule showing the calendar time it will take to complete the work. This overall plan is baselined (this is the planned value) and used to measure performance throughout the project. As each work package is completed (earned) it is compared with planned value, showing the work achieved against plan. A variance to the plan is recorded as a time or schedule deviation.

- Schedule Variance = Earned Value – Planned Value
- Cost Variance = Earned Value – Actual Costs
- Schedule Performance Index = Earned Value/Planed Value
  - SPI Greater than 1.0 indicates that more work was completed than was planned.
- Cost Performance Index = Earned Value/Actual Cost
  - CPI Value lower than 1.0 indicates a cost overrun

Forecasting

- EAC (Estimated At Completion)
  - Forecast at Budgeted Rate: EAC = AC +BAC – EV
  - Forecast at the Present CPI: EAC = BAC/Cumulative CPI
  - Forecast at the SPI and CPI: AC + [(BAC-EV) / Cumulative CPI X Cumulative SPI)]
  - To Complete Performance Index:
    - TCPI Based on the BAC: BAC: (BAC-EV) / (BAC-AC)
    - TCPI Based on the EAC: (BAC-EV)/ (EAC-AC)



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ABOUT CENTERPOINT CONNECT

Centerpoint Connect Roofing Software was born out of a desire to build something unlike anything on the market. Our software is robust, flexible, scalable, yet easy to use. While not all roofing contractors are the same, many of the same functions are performed, such as inspections, checking in and out on service calls, or custom reporting.oofing software was born out of a desire to build something unlike anything on the market. Our software is robust, flexible, scalable, yet easy to use. While not all roofing contractors are the same, many of the same functions are performed, such as inspections, checking in and out on service calls, or custom reporting.



Our platform is a proven system developed from best practices and designed to drive industry success yet flexible enough to be utilized for roofing contractors.

Centerpoint Connect is fully customizable, including color scheme, client portal, email notifications, and more. It can systematize your sales and production processes and further help you streamline your business.

Contact us today to discover how Centerpoint Connect can improve your business.

https://centerpointconnect.com/get-a-free-demo



ROOFING PROJECT MANAGEMENT GUIDE

Centerpoint Connect

Roofing Project Management Guide
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