




Construction - Part 2



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Construction - Part 2


- Change Orders
- Quality Assurance Program
- Final Inspection
- Traffic Control





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Change Order Definition

When work is needed that is different or in addition to the work provided for in the construction contract documents

Written agreement between the contractor and the Project Sponsor modifying the existing contract

Needs prior approval from NHDOT

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7 Types of Change Orders

- Normal / Non Critical
- Critical path
- Emergency condition
- Time extension
- Non-participating
- Balance and excess
- Final balancing




The process is generally the same for each above, the time for "Emergency Condition" and "Critical Path" CO's is less

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7 Change Orders steps


- 1) Identify need
- 2) Engineer's IGE
- 3) Contractor's cost estimate
- 4) Engineer's Justification
- 5) Negotiate & submit
- 6) Wait for NHDOT approval
- 7) Execute Change Order



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CO Step #1 – Identify Need


Contractor, Contract Administrator (CA), Engineer of Record and Sponsor identifies need **in writing**

Example
Contractor needs more drainage pipe:


- Needs additional 15 feet of 15" pipe **(existing contract item)**
- Needs 24 feet of 24" pipe **(Not in contract)**



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CO Step #2 - Engineer's IGE

Justify draft change order in writing


- Description of work
- Schedule impact
- Cost implication (IGE)
- All backup to justify need



If justified, then request price from contractor (recommended to seek NHDOT's opinion at this step)


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CO Step #3 – Contractor's Cost Estimate

Price items per unit price specifications



Example contractor change order price installed per foot

- \$10 per foot for 15" pipe
- \$20 per foot for the 24" pipe

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CO

CO Step #4 – Engineer’s Justification

Are unit prices reasonable?

- Existing Contract Item (15” pipe)
 Verify change order unit price (\$10/FT) is close to existing contract unit price.
 If CO quantity is significantly more than base bid quantity? Then change order unit price should come down.
- New Contract Item (24” pipe)
 Review and document weighted average unit prices and/or other similar projects for comparison to contractors change order price.

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CO

CO Step #5 – Negotiate & Submit


Similar to scope & fee

- Discuss any differences in scope or understanding of the proposed CO
- Negotiate among Contractor, Sponsor, Contract Administrator and Engineer of Record to determine cost
- **Document and submit draft CO & IGE to NHDOT for review and approval**

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CO Step #6 – Wait for Approval

NHDOT process


- Review draft CO
- Discuss with FHWA
- Request additional funds from NHDOT Program Manager and FHWA



NHDOT process can take time and no change order work can begin until NHDOT approval in writing


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CO Step #7 – Execute Change Order

- All parties sign the Change Order per the contract documents
- **Copy the NHDOT on the signed executed document**
- We prefer a PDF



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Emergency and Critical Path CO's

Same Process but Expedited

- **Emergency:** Imminent danger or unsafe condition
- **Critical Path:** Item will delay the project based on CPM project schedule
- **Still need NHDOT prior approval**


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Time Extension and Non-Participating CO's

- **Contract Time Extensions:** Need to be documented and approved by NHDOT *Liquidated damages may come into play for additional CE time*
- **Non-Par Changes:** Need to be tracked by NHDOT and included in the overall project costs

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Balance & Excess CO's

Change Orders Along the Way

- NHDOT requires comparing the contract item totals with the installed quantities at the 25%, 50%, 75% and 90% stages of a project
- This helps to identify the need for additional funds early and gives time to run a balance and excess change order if necessary

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Final Balancing CO

Final Change Order at project completion

- Documents final pay quantities for every item constructed
- It is too late to ask for additional funds at this point in time
- **Change Orders need to be approved prior to that work beginning**

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Construction - Part 2

- Change Orders
- **Quality Assurance Program**



- Final Inspection
- Traffic Control



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Quality Assurance Program

Basics:

- **Acceptance Testing:**
Done by Construction Engineer
- **Independent Assurance Testing:**
Done by NHDOT Bureau of M&R
- Both shall follow QAP document titled:
"NHDOT Quality Assurance Program for Municipally Managed Federal-Aid Projects"

QAP document in LPA handouts

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QAP


Quality Assurance Program

Construction Engineer

- Fills out *Quality Assurance Program Information Form* based on items in contract (concrete, asphalt, etc...)
- Submits form to NHDOT Bureau of M&R at beginning of construction phase
- Follows testing guidance in document



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QAP


Quality Assurance Program

Frequency of testing example

| Material | Property | Test | Acceptance test by CE | Assurance test by NHDOT |
|-------------------|-------------------|---|----------------------------|---|
| 304.1 Sand | Compaction | AASHTO T191, T310, or Test Strip | In Place 1/1,200 CY | One CE Test with NHDOT present (within last calendar year) |

Assurance Testing is mostly “testing the tester”

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QAP **Quality Assurance Program**

Certifications for Testers

- **Soil and Asphalt Testers** need Certification from **NETTCP** (North East Transportation Training & Certification Program)
- **Concrete Testers** need Certification from **NETTCP** or **ACI** (American Concrete Institute)

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QAP **Quality Assurance Program**

Project records

- A "**Lab Book**" shall be part of project records that has documentation of tests performed and test results
- The CE must certify at the end of the project that materials incorporated into the work were in conformance with plans and specifications

CE Certificate form in LPA handouts

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Quality Assurance Program Qualified Products List

Some items are prequalified for quality:

Example:

Item #559.41 - Asphaltic Plug For Crack Control

559.2.1 – “The asphaltic expansion joint shall be one of the products listed on the Qualified Products List”

www.dot.nh.gov/about-nh-dot/divisions-bureaus-districts/materials-research/qualified-product-information

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- Change Orders
- Quality Assurance Program
- **Final Inspection**



- Traffic Control

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Final Inspection

Who to Invite?

- Sponsor, CE, Contract Administrator, Engineer of Record, Contractor, NHDOT Project Manager and FHWA
- Also, NHDOT Highway Maintenance if NHDOT will have maintenance responsibility



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Final Inspection

Punch List ... then Complete & Accept letter

- Inspect project for flaws, incomplete work and needed changes
- Contract Administrator generates **Punch List**
- Once Punch List is satisfactorily completed, Sponsor issues **Complete and Accepted letter** with **date** the project was turned over to the Project Sponsor and maintenance begins

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Construction - Part 2

- Change Orders
- Quality Assurance Program
- Final Inspection
- **Traffic Control**



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Why Work Zone Traffic Control ?


To reduce crashes




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 **Why Work Zone Traffic Control ?**




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 **Traffic Control**


Work zones create unexpected conditions for the travelling public which can harm construction workers, cause traffic crashes, injuries and/or fatalities



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Goals for Work Zone Traffic Control

- Protect construction workers
- Protect the travelling public
- Provide acceptable levels of traffic capacity for the travelling public
- Maintain access to abutters
- Provide flexibility based on work zone operations
- Follow **Manual of Uniform Traffic Control Devices (MUTCD)**


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W20-1




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Work Zone Considerations


2 Questions to ask:

- What are you doing?
“the construction operation”
- Where are you doing it?
“the transportation setting”




W20-7a

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Work Zone Considerations


Operation Considerations:

- Width and length of work zone
- Duration of work
- Time of work (night vs. day)
- Rolling operation or stationary
- Type of construction equipment
- Where will the drainage go?




W20-7a

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Work Zone Considerations

Setting Considerations:

- Type or class of roadway
- Traffic volumes
- Roadway geometry / sight lines
- Speed of traffic
- Other Traffic: Pedestrians / Bikes / Trains / Boats / Airports / Railroads?
- Business access
- Other nearby work zones



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Work Zone Traffic Control Plan

- A project specific **Traffic Control Plan (TCP)** shall be developed as part of the design process
- The **TCP** shall be based on standard sequences of signs or other traffic control devices as shown in **NHDOT Highway Design Manual & MUTCD Part 6 - Temporary Traffic Control**

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Work Zone Traffic Control Plan

Lane Closure on a Two-Lane Road Using Flaggers

MUTCD Figure 6H-10


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Traffic Control Inspection

During construction the Contract Administrator should make frequent reviews of actual traffic control installations




W20-7a

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Work Zone Traffic Control

DO's

{


- Clean signs
- High reflectivity
- Good condition
- Fresh temporary pavement markings

DONT's

{

- Dirty / broken signs
- Missing reflectivity
- Spray paint on plywood
- Duct tape on signs
- Faded temporary pavement markings

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Traffic Control Web Links

Engineers and Consultants section



**Scroll to
bottom,
Work Zone
Plans, Policy,
and Safety**

<https://www.dot.nh.gov/doing-business-nhdot/engineers-consultants>

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Important Traffic Control Links

NHDOT Website Links

- 1) Work Zone Training for Law Enforcement
- 2) Flagger and Law Enforcement Policy
- 3) Work Zone Safety and Mobility Policy
 - Traffic Control Committee
 - Work Zone Crash Report requirement

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TC

Link #1 - Law Enforcement Training Requirement




Correct Paddles

Law Enforcement Training in LPA handouts

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TC

Link #2 - NHDOT Flagger and Law Enforcement Policy


- Provides guidance for use of flaggers and uniformed officers
- Purpose is to maintain the highest level of safety and reduce costs
- LPA shall follow policy

Flagger Policy in LPA handouts

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Link #3 -Work Zone Crash Reporting


- Work zone crashes shall be reported to the NHDOT by the Sponsor and/or Consultant
- Use **Work Zone Crash Report (WZCR)**
- Submit completed WZCR's to your Project Manager (hard copy or scanned email)



WZCR Report in LPA handouts






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Construction - Part 1

Re-Cap

- Preconstruction Meeting 
- Contractors CPM Schedule 
- Oversight & Inspection 
- Project Records 
- Construction Reimbursement 

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Construction - Part 2


Re-Cap


CHANGE ORDER

| | | | |
|---|-------------------|------------------|----------------|
| PROJECT INFORMATION | | | |
| PROJECT NUMBER | DATE | ISSUE NUMBER | ISSUE DATE |
| PROJECT NAME | PROJECT OWNER | PROJECT LOCATION | PROJECT STATUS |
| ISSUE TYPE | ISSUE DESCRIPTION | ISSUE STATUS | ISSUE COMMENTS |
| CHANGE THE FOLLOWING ROWS TO THE ORIGINAL CONTRACT: | | | |


- Change Orders
- Quality Assurance Program
- Final Inspection
- Traffic Control







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Construction

Questions?



Next Up: Closing Remarks



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