



Caltrans Local Assistance

RESIDENT ENGINEER ACADEMY

Module 9

Change Orders

January 2025

Change Orders: Objectives

Be able to ...

- Understand the purpose of a Change Orders (CO)
- Determine if the CO is within the scope of your contract
- Write a CO
- Determine appropriate method of payment
- Write a CO memorandum

Definition

Change Order is...

a legally binding document used to make changes to the contract.

Purpose

Reasons for writing Change Orders (CO)

- Change plans/specifications
- Add work

LAPM 16.13 Change Orders

Purpose

Reasons for writing COs (continued)

- Specify method of payment for contract stipulated extra work
- Authorize additional funds for existing CO
- Adjust item payment (+/- 25%)

CM 5-303 Purpose of Change Orders

Purpose

Reasons for writing COs (continued)

- Implement a value engineering change
- Clarify terms of the contract
- Resolve disputes/potential claims prior to the proposed final estimate

CM 5-303 Purpose of Change Orders

Initiation

Who initiates the CO:

- Resident Engineer
- Contractor
- Other Agency Units
- Outside Agencies
- Others?

CM 5-304 Initiation of Change Orders

Scope

Questions...

- Is proposed change within the project scope?
- Where is project scope found?

Scope

Within the project scope

- Significantly different from other contract work?
- Necessary to mobilize specialized forces and equipment?
- Over the approved contract allotment?
- Significant deletion to the original contract?
- Outside the approved contract limits?

Preliminary Considerations

Questions to ask...

- Is the proposed work already covered in the contract?
- Is CO necessary to complete the work as contemplated at PS&E approval?
- Are there sufficient contingency funds?
- Can additional funds be obtained soon enough to prevent delays?

CM 5-305 Preliminary Considerations

Preliminary Considerations

Questions to ask...

- What is the overall impact on the planned work?
- Will it cause a work character change?
- Will the contract time be affected?
- What methods of payment should be used?
- How will any adjustments of compensation be determined?

CM 5-305 Preliminary Considerations

Preliminary Considerations

Does CO impact your environmental documents?

Contact Caltrans if change may affect:

- permit conditions,
- environmental mitigation commitments, or
- introduction of new social, environmental, or economic issues that need to be addressed under applicable federal, state, or local law

LAPM 16.10 Change Orders

Writing the Change Order

Change Order describes the:

- Work:** Changes or added (extra)
- Payment** basis
- Time** adjustment

CM 5-306 Change Order Content

Writing the Change Order

Clearly and concisely...

- Describe the changes and extra work
- Detail location and limits of proposed work
- PE Stamp, sign and date *Engineering* plans, specs, calculations and reports
- Include specs or spec changes

CM 5-306 Change Order Content

Specifications

Include specifications in the CO?

- Increases in **contract bid item**: No
- **Extra Work** (AP or FA): Yes
Include the specifications directly or by reference

The contractor must complete extra work exactly as it is specified in the CO.

CM 5-306A Specifications

Method of Payment

Order of preference:

1. Bid items at bid item unit prices
2. Bid items at bid item unit prices *with a payment adjustment at agreed unit price or lump sum*
3. Extra work at agreed unit price or lump sum
4. Extra work at force account

**One or a combination of the
above methods.**

**CM 5-306C Methods of Payment
CTSS 9-1.03, Payment Scope**

Method of Payment

Not extra work if it can be paid for by:

- A bid item,
- A combination of bid items, or
- A bid item with a payment adjustment

CM 5-306C Methods of Payment

Method of Payment

Increases in Bid Items at Bid Item Prices:

At station 782 + 32, perform excavation and backfill for the reinforced concrete box culvert shown on sheet 3 of 3 of this change order.

Item No. 43), Structure Excavation: 270 CF (7 %) @ \$8.83/CF = \$ 1,942.60 (+18 %)

Item No. 44), Structure Backfill: 250 CF (3%) @ \$18.85/CF = \$ 4,712.50 (+11 %)

Increases in Bid Items at Bid Item Prices = \$ 6,655.10

CM 5-306C Methods of Payment

Method of Payment

Extra work at agreed prices

- Agreed Unit Price
- Agreed Lump Sum

Contractor must agree!

CM 5-306C Methods of Payment

Method of Payment

Agreed price documentation:

- Must perform an independent force account cost estimate:
 - Performed by the agency *independently* of Contractor
 - Supports the agreed price in the CO
 - Signed and dated by Preparer
 - Signed and dated by *Checker*
 - Filed

Method of Payment

Agreed price
documentation:
Force Account Style
Cost Estimate

9.1 Handout page 2

Estimate of cost saving to the Contractor to use an Inertial Profiler in lieu of the California Profilograph called for in the contract. (CCO 7)					
Assume Inertial Profiler will perform the work in 1/2 day with one operator and no lane closures. Assume the CA Profilograph would have used 1 operator and taken 3 days					
Cost Savings will be:					
1. Cost savings of 3 days of CA Profilograph vs 1/2 day Inertial Profiler (Operator and Equip.)					
<u>Operator Savings:</u>					
Operator Rate = \$59.85/hr. x 1.12 (labor surcharge) x 1.35 (labor Markup) = \$ 90.49/hr					
Hours saved = 3 days (work as orig planned) - 0.5 days (work per CCO) = 2.5 days saved.					
Operator Cost Savings = \$90.49/hr x 8 hr/day x 2.5 days saved =					\$1,809.86
<u>Equipment Savings:</u>					
(Cost to use CA Profilograph for 3 days - cost to use Inertial Profiler for 1/2 day.)					
CA Profilograph Cox CS 8500 \$15.81/hr x 1.15 (Equip. Markup) x 8 hr x 3 days =					\$436.36
Inertial Profiler CS9100 Mid \$18.44x/hr x 1.15 (Equip. Markup) x 4 hr x 1 day =					\$84.83
Equipment Savings:					
2. The savings for elimination of 3 days of traffic control lane closures.					
<u>Labor Savings:</u>					
Laborer Rate = \$45.28/hr x 1.12 (labor surcharge) x 1.35 (labor Markup) = \$ 68.4					
Laborer Costs Savings = \$68.46/hr x 2 laborers x 8 hr x 3 days =					\$3,286.08
<u>Equipment Saving:</u>					
Equipment	rate	Qty	per hr/d	hrs (days)	cost
Truck (12-20)	\$32.90	1	hr	8	\$263.20
Truck Arrow	\$0.78	1	hr	8	\$6.24
Arrowboard	\$3.33	1	hr	8	\$26.64
Cones(100)	\$7.77	1	day	1	\$7.77
3 Signs	\$2.48	3	day	1	\$7.44
Beacon	\$5.48	1	day	1	\$5.48
Daily Equipment Rate					\$316.77
\$316.77 (Daily Equip rate) x 1.15 (Equip. Markup) x 3 days (traffic control days)					\$1,092.86
Total Credit to Agency					\$6,709.99
Calculated by: <u>Joe Engineer, 2/18/2013</u>					
Checked by: <u>Jane Engineer, 2/20/2013</u>					



Method of Payment

Extra Work at Force Account

Use when:

- The work cannot be estimated within reasonable limits of accuracy
- The RE and contractor are unable to *agree* on an agreed price
- When the work is urgent/time sensitive

CM 5-306C Methods of Payment

Method of Payment

If a work-character change has occurred:

1. Determine a correct and equitable adjustment in compensation *to the bid item unit price*
2. Last resort – Delete the entire bid item, or the portion of it affected by the change, and pay for the entire work as extra work

CM 5-306C Methods of Payment
CTSS 4-1.05B Work-Character Changes

Time Extensions/Reductions

Add contract time in a CO?

- CO must affect the scheduled completion date
 - contractor submits a Time Impact Analysis (TIA)
- If CO work **affects the controlling activity** on the critical path, there *may* be basis for a time adjustment.
- The Department grants a time extension only if the **total float is absorbed** and the **scheduled completion date** is delayed 1 or more working days.

CTSS 8-1.02D(8)(c) Ordered Changes
CM 5-306D Adjustment to Time of Completion

Deferred Time Adjustment

- Can't determine / agree on an adjustment of time
- Determine time adjustment as soon as work is completed
- Unilaterally approve the supplemental CO if you still cannot agree

LAPM 16.10 Change Orders
CM 5-306D Adjustments to Time of Completion

Time Adjustment Documentation

- File TIA used to support CO time adjustment.
- No supporting documentation
 - = loss of federal funds
 - = number unsupported days given x LDs(\$)

LAPM 16.10 Change Orders
CM 5-306D Adjustments to Time of Completion

Resources

Caltrans Construction Manual Chapter 5 Contract Administration Section 3 Change Orders

Change Order Standard Clauses:

<https://dot.ca.gov/programs/construction/change-order-information/change-order-standard-clauses>

Examples of Change Orders:

<https://dot.ca.gov/programs/construction/change-order-information/change-order-examples>

Sample Clauses

Adjustment for Increase in Quantities in Excess of 25 Percent of the Quantities Shown on the Bid Item List

Standard Clause:

Payment adjustment in accordance with Section 9-1.06B “Increases of More Than 25 Percent,” of the *Standard Specifications*:

The following adjustment(s) will be made for units of work in excess of 125 percent of the quantities shown on the bid item list:

[List the bid(s), unit adjustments, quantities, and total item adjustment(s).]

Sample Clauses

Extra Work or Payment Adjustment at Agreed Unit Price

Standard Clause:

For this work, the contractor shall receive and accept \$ ___ per [*unit*] of [*pipe, fence, among other items*].

This sum constitutes full and complete compensation for furnishing all labor, material, equipment, tools, and incidentals including all markups by reason of this change.

Change Orders Examples

CM Example

Work-Character Change

Item Increase, Payment Adjustment, Extra Work at Force Account

9.1 Handout - page 3

Change Requested by: Engineer Contractor

CHANGE ORDER NO.	SUPPL. NUMBER	CONTRACT NUMBER	CO-RTE-PM	FEDERAL NUMBER(S)
7				

TO _____, contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. NOTE: This change order is not effective until approved by the engineer.

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Bid Item List.

As shown on sheet 3 and 4 of this change order, place a permeable blanket and underdrain system from Station "A" 725+00 to "A" 737+00 using Class 1 permeable material.

Between Stations "A" 722+50 and "A" 725+00, remove the previously placed Class 3 permeable material (blanket), incorporate the permeable material into the embankment at "A" 715+00, and dispose of the filter fabric. Reinstall the permeable material (blanket) as planned using Class 1 permeable material instead.

Class 1 permeable material in accordance with Section 68-2.02F(2), "Class 1 Permeable Material" of the *Standard Specifications* will now be used in all permeable blankets on this contract in lieu of the specified Class 3 permeable material.

Increases in Bid Items at Bid Item Prices:

Item 6 Roadway Excavation: 185 cy (1%) @ \$34.00/cy =	\$6,290.00 (+8%)
Item 46 8-inch Perforated Plastic Pipe Underdrain: 2,600 lf (23%) @ \$60.00/lf =	\$156,000.00 (+23%)
Item 48 Permeable Material (Blanket): 17,760 ton (27%) @ \$6.00/ton =	\$106,560.00 (+27%)

Estimate if Increases in Bid Items at Bid Unit Prices: \$268,850.00

Any payment adjustment due in accordance with Section 9-1.06B, "Increases of More Than 25 Percent," of the *Standard Specifications*, for Bid Item 48 is deferred.

Payment Adjustment at Agreed Unit Price:

In lieu of Class 3 permeable material, as specified for Item 48, Permeable Material (Blanket), use Class 1 permeable material for all permeable blankets. In accordance with Section 4-1.05B, "Work-Character Changes," of the *Standard Specifications*, the contractor agrees to accept \$1.48 per ton permeable material (blanket). This sum constitutes full payment, including all markups, for this change.

Estimated Payment Adjustment at Agreed Unit Price: 80,000 tons @ \$1.48/ton = \$118,400.00

Extra Work at Force Account:

As determined necessary by the engineer, remove the previously placed Class 3 permeable material (blanket) from the roadbed between Stations "A" 722+50 and "A" 725+00, incorporate the permeable material into the embankment at Station "A" 715+00 and dispose of the blanket's filter fabric.

Estimate of Extra Work at Force Account = \$17,000.00

Based on a time impact analysis, this change affect the controlling activity by 8 days. A time adjustment of 8 working days is granted.

Change Requested by: Engineer Contractor

CHANGE ORDER NO.	SUPL. NUMBER	CONTRACT NUMBER	CO-RTE-PM	FEDERAL NUMBER(S)
8				

TO

, contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. **NOTE: This change order is not effective until approved by the engineer.**

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Bid Item List.

Payment Adjustment at Agreed Lump Sum:

In accordance with Sections 8-1.02, "Schedule," and 8-1.07, "Delays," of the *Standard Specifications*, the contractor shall be compensated for the delay to the controlling activity, roadway excavation (earthwork), from September 29, 2011, through October 12, 2011, caused by relocation of the city waterline.

The contractor agrees to accept the sum of \$6,853.00 as full compensation for idle equipment. No adjustment or idle time of workers will be made since a full work day was completed on September 28, 2010, before work was delayed.

The contractor agrees to accept the sum of \$2,350.00 as full compensation for the cost of moving equipment made necessary by the delay.

In accordance with Section 9-1.11, "Time-Related Overhead," of the *Standard Specifications*, the contractor shall be compensated for time-related overhead caused by the delay.

\$45,000.00 (Item No. 3, Time-Related Overhead (LS)/150 working days = \$300/WD X 10 WDs = \$3,000.00.

As determined by a pro-rated adjustment to lump sum Bid Item No. 3, "Time-Related Overhead," the contractor agrees to accept the sum of \$3,000.00 as full compensation for the additional time-related overhead.

The contractor agrees to accept the sum of \$12,203.00 as full and complete compensation for this change.

Payment adjustment at Agreed Lump Sum = \$12,203.00

Time Adjustment:

A determination of delay in completion of the contract due to the delay of the controlling activity, roadway excavation (earthwork), from September 29, 2011, through October 12, 2011, has been made in accordance with Sections 8-1.02, "Schedule," and 8-1.07, "Delays," of the *Standard Specifications*. The contractor is granted 10 working days for the following dates: August 29, 2011, through September 12, 2011, inclusive.

Change Orders Examples

CM Example

Critical Delay

Payment Adjustment at Agreed Lump Sum and Time Adjustment

9.1 Handout - page 4

Memorandum

What is the CO Memorandum?

- Internal document
- Explains the scope and reasons for the change
- Provides justification for the work
- Supports reasonableness of the compensation
 - Money
 - Time

CM 5-307 Change Order Memorandum

Memorandum

Include:

- Summary line or two of what the change order provides
- Why the change is needed

CM 5-307 Change Order Memorandum

Memorandum

Include:

- Why the particular method of payment was chosen.
- State the method used in making the cost analysis
- Include the cost analysis in the files

CM 5-307 Change Order Memorandum

Memorandum

Include:

- Justification for **contract time adjustment**:
 - State controlling operation during the delay period
 - Indicate the specific calendar or working days represented by the time extension (if work done)
 - Note that TIA is on file

CTSS 8-1.07B

Green Book 6-4.2 Extensions of Time

Memorandum

Include:

- Who requested the change
- Names and dates of concurrences obtained
- Explanation of any concurrences not obtained

CM 5-307 Change Order Memorandum

Memorandum

Explain why if ...

- **Work character change** results from CO
- CO was **unilaterally approved**

CM 5-307 Change Order Memorandum

Change Orders Memorandum

Example: Work-Character Change 9.1 Handout - page 5

DATE _____

TO			FILE	
FROM			CONTRACT NO. _____	
			CO-RTE-PM _____	
			FED NO. _____	
CHANGE ORDER NO. 7	SUPPLEMENT NO.	CATEGORY CODE CCSA	CONTINGENCY BALANCE (Including this change) \$ _____	
CHANGE ORDER AMOUNT \$ _____			HEADQUARTERS APPROVAL REQUIRED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
SUPPLEMENTAL FUNDS PROVIDED \$ 404,250.00			IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? <input type="checkbox"/> YES <input type="checkbox"/> NO	
ORIGINAL CONTRACT TIME: _____ DAY(S)	TIME ADJUSTMENT THIS CHANGE: 8 DAY(S)	PREVIOUSLY APPROVED TIME ADJUSTMENTS: _____ DAY(S)	PERCENTAGE TIME ADJUSTED (Including this change) _____ %	TOTAL # OF UNRECONCILED DEFERRED TIME (Including this change) _____

THIS CHANGE ORDER PROVIDES FOR (Use additional pages as needed):

This change order provides for:

- 1) A work-character change to furnish Class 1 permeable material in lieu of the specified Class 3 permeable material.
- 2) Removing the previously placed planned Class 3 permeable material and incorporating into embankment.
- 3) Extending the permeable blanket and underdrain system to "A" 737+00.

Reason for Change:

The Class 3 permeable material specified in the special provisions has not functioned properly. The district materials engineer recommended that Class 1 permeable material be used instead for all permeable blankets. Unanticipated groundwater has been encountered throughout the entire section of the roadway between Stations "A" 725+00 and "A" 737+00. The district materials engineer recommended that the planned permeable blanket and underdrain system between Stations "A" 722+50 and "A" 725+00 be extended to Station "A" 737+00. The district materials engineer's letter recommending these changes is attached.

Method of Payment:

This change order increases the quantities of Bid Item 6, "Roadway Excavation"; Bid Item 46, "8-inch Perforated Plastic Pipe Underdrain"; and Bid Item 48, "Permeable Material (Blanket)." Consideration of a payment adjustment for the overrun in Bid Item 48, "Permeable Material (Blanket)," is deferred until completion of item work.

A work-character change payment adjustment at an agreed unit price is provided for the material change to Bid Item 48, "Permeable Material (Blanket)." The payment adjustment, based on the contractor's force account analysis and verified by the engineer, represents the increased cost in processing the permeable material. Calculations supporting the payment adjustment are on file in the project records.

Removing and incorporating the previously placed Class 3 permeable material in the embankment fill will be paid as extra work at force account. There is no bid item applicable to this work.

Time Adjustment:

The contractor requested a time adjustment of an additional 8 working days. Placing the additional permeable material will delay structural section work (the controlling activity), and a time adjustment is granted to begin producing the Class 1 permeable material. The engineer's time impact analysis, on file with the contract records, verifies that an 8-day time adjustment is reasonable.

Change Orders Memorandum

Example: Critical Delay 9.1 Handout - page 6

DATE _____

TO			FILE	
FROM			CONTRACT NO. _____	
			CO-RTE-PM _____	
			FED NO. _____	
CHANGE ORDER NO.	SUPPLEMENT NO.	CATEGORY CODE	CONTINGENCY BALANCE (Including this change)	
8		AGZZ	\$ _____	
CHANGE ORDER AMOUNT			HEADQUARTERS APPROVAL REQUIRED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
\$ 12,203.00 <input checked="" type="checkbox"/> INCREASE <input type="checkbox"/> DECREASE				
SUPPLEMENTAL FUNDS PROVIDED			IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? <input type="checkbox"/> YES <input type="checkbox"/> NO	
\$ _____				
ORIGINAL CONTRACT TIME:	TIME ADJUSTMENT THIS CHANGE:	PREVIOUSLY APPROVED TIME ADJUSTMENTS:	PERCENTAGE TIME ADJUSTED (Including this change)	TOTAL # OF UNRECONCILED DEFERRED TIME (Including this change)
_____ DAY(S)	10 DAY(S)	_____ DAY(S)	_____ %	_____

THIS CHANGE ORDER PROVIDES FOR (Use additional pages as needed):

This change order provides for:

Compensation for a delay to the controlling work in accordance with Section 8-1.07, "Delays," of the *Standard Specifications*.

Reason for Change:

A 12-inch waterline, crossing the right-of-way at Station "A" 453+45, was previously lowered and placed in a steel conduit by others under an encroachment permit before construction work began on this contract. During roadway excavation activities, the State inspector made an elevation check on the waterline. The line is critical for water service in the area and could only be taken out of service for short periods of time. Therefore, roadway excavation, the controlling activity at the time, was suspended from September 29, 2011, through October 12, 2011, while city crews lowered the waterline to an elevation below the planned subgrade.

While the contractor relocated some of the roadway excavation equipment to other work, the remainder of the equipment that was made idle by the delay remained on the job site. A payment adjustment at agreed lump sum provides for the cost of idle equipment calculated, as specified in Section 8-1.07, "Delays," of *Standard Specifications*. Records were kept of the equipment moved off the site to other work and moved back in when roadway excavation resumed. The move-out and move-in costs are paid for as a payment adjustment at agreed lump sum.

Method of Payment:

There will be no payment adjustment for the idle time of workers because of full work day was completed on September 28, 2010, before the work was delayed.

Time Adjustment:

A time adjustment of 10 working days is confirmed by a time impact analysis in accordance with Sections 8-1.02, "Schedule," of the *Standard Specifications*. Roadway excavation (earthwork) was the controlling activity during the delay period between September 29, 2011, and October 12, 2011, inclusive. In accordance with Section 9-1.11, "Time-Related Overhead," of the *Standard Specifications*, a pro-rated payment adjustment at agreed lump sum is provided for Bid Item No. 3, "Time-Related Overhead," for the 10-day delay.

Records and calculations for the payment adjustment are on file with the project records.

Federal Funding Participation

- **Indicate on the Memorandum:**
 - Federal fund participation,
 - Participation in part, or
 - Nonparticipation

Don't use nonparticipation to circumvent federal requirements.

LAPM 16.10 Change Orders

Nonparticipating Items

9.1 Change Order – Handout pages 7 & 8

FHWA List of Frequently Encountered
Non-Federal Participating Items

LAPM 16.10 Change Orders

Prior Authorization

- Prior Authorization allows changes or extra work to be performed prior to a fully executed change order.
- Must be written authorization.
- Change order must be written within 7 days of written authorization.

LAPM 16.10 Change Orders

Payment

**Payment cannot be made until
Change Order is fully executed!**

LAPM 16.10 Change Orders