

109.04 Adjustments in the Contract Price

General

Supplemental agreements are used to make changes to ADOT construction contracts. They add or delete work to the contract and adjust the contract amount accordingly. Supplemental agreements, specifically change orders, may also be used to change or waive specifications, even when there is no effect on contract costs.

When signed by the Contractor and the Resident Engineer, supplemental agreements are binding legal documents that supplement the original contract.

Four different types of supplemental agreements may be used to amend ADOT construction contracts:

1. A *letter of agreement* is used if the cost of the extra work is less than \$10,000. This is simply a letter sent by the RE to the Contractor describing the change and paying for that change with a lump sum amount. Payment is made under Item 9240101, Miscellaneous Work (Resident Engineer Use Only). Letter of agreements are not to be used to change, add or delete a specification.
2. A *change order* uses existing items and unit prices in the bidding schedule or establishes new items and unit prices to pay for extra work. A supplemental agreement form is sent to the Contractor describing the change and listing the pay items and unit prices affected by the change. Much supporting documentation such as a detailed cost analysis, revised design details, and plan sheets are contained in a change order.
3. A *force account* compensates the Contractor for extra work based on the actual hours worked, equipment and materials used (time and materials). It is the most cumbersome and administratively complex supplemental agreement. It contains all the supporting documents found in a change order, plus additional record keeping requirements once the force account work begins.
4. A *time extension* can grant the Contractor additional days to complete the project. The contractor initiates this based on valid reasons to grant additional contract days. The Resident Engineer reviews and recommends a number of additional days. The District Engineer grants final approval.

The type of supplemental agreement used depends on the cost and complexity of the contract change. Simpler changes can be done by minor alteration, while the more complex changes, for which costs are difficult to quantify, may need to be done by force account. The order of increasing complexity is:

1. letter of agreement, 109.04(A),
2. quantity adjustments by change order using existing pay items, 109.04(B),
3. detailed estimate (cost analysis) by change order, 109.04(C), and finally
4. force account, 109.04(D).

The Letter of Agreement

The letter of agreement is best suited when the changes are simple, can be easily identified and estimated, and cost \$10,000 or less. Letter of agreements are the easiest for the Department to administer and do not require an extensive approval process. The letter of agreement can also be used to credit the Department for cost savings that result when the RE relaxes minor specification requirements. The intent shouldn't be to nickel-and-dime the Contractor, but to recover legitimate cost savings when the Contractor is clearly realizing a quantifiable economic benefit as the result of a change.

The Change Order

A more formal documentation and approval process is needed for this type of supplemental agreement. If the change cannot be handled by adjusting the quantities of existing contract items—109.04(B), then a detail cost analysis of the extra work must be performed—109.04(C). The change order is best suited when the work can be quantified ahead of time. Since change order prices are generally agreed on before the extra work begins, Contractors may include many contingencies in their cost estimates to offset any perceived risks.

A zero dollar procedural change order is established when changes, additions or deletions are made to the specifications.

The Force Account

The force account should be the supplemental agreement of last resort because it is the most expensive and administratively tedious. The force account is used for contract changes in which the amount of work is difficult to quantify (such as an emergency situation) or the financial risks of performing the work are too high for the Contractor. The RE estimates ahead of time what he or she believes the extra work will cost and gets the necessary approvals to establish the force account. Once the work begins, daily records are kept of the labor, materials, and equipment used to accomplish the extra work. The Contractor takes these daily records and invoices to the Department for the work, based upon preapproved hourly rates and material costs. The field office reviews and approves these invoices before paying the Contractor.

To sum up, the force account is best used when:

1. defining the work clearly and accurately enough for a change order is too difficult,
2. the extra work needs to begin right away, or
3. the RE and the Contractor cannot agree on costs.

Investigation and Preparation

Subsection 104.02 of this manual describes the different types of contract changes and the process for analyzing any contract change. In 104.02 we said that the Resident Engineer must basically answer these four questions when analyzing a contract change:

1. Was there a contract change? (What was the change?)
2. Who caused the change?
3. What are the impacts of the change?

4. What are the costs?

Subsection 104.02 should be referred to when investigating and analyzing any contract change.

The results of analyzing a contract change are documented in the supplemental agreement. See section on "Documentation" that follows.

Cost Analysis

An RE's cost analysis is required for all supplemental agreements including force accounts and letters of agreements. Cost analyses for extra work are best done by carefully examining the impacts of the change first, then looking at costs last.

Here is a rudimentary procedure that can be used on any cost analysis that will keep you focused on analyzing the impacts first before you are ready to examine costs:

1. Quantify the Extra Work

This means calculating the amount of work that has to be performed: such as cubic yards (cubic meters) of dirt to move, linear feet (meters) of guardrail to install, or pounds (kilograms) of rebar to eliminate. The trick here is not only calculating the quantity correctly, but also selecting the correct unit of measurement. Your selection should be based on industry practice and what unit of measurement best represents how the work will be performed. For example, excavation work is usually done on a cubic yard (cubic meter) basis because excavation work involves moving volumes of material. On the other hand, structural concrete is usually estimated on a square yard (square meter) basis and not by the cubic yard (cubic meter) basis ADOT uses to measure it for payment. Most of the expense in structural concrete is in the formwork and not in the amount of concrete used. Selecting the correct unit of measurement is an important element in producing an accurate analysis.

2. Analyze the Construction of the Work

Construct the work in your mind. Write down all the different steps that have to be followed (continuously ask yourself who will do what, where, when, and how?). This is where your analytical thinking as a technician or engineer is of prime importance. One reason project supervisors' estimates are usually less than the Contractor's on extra work is that Project Supervisors fail to take into account all the little hidden extras that add to the cost of the work (ex., additional crane time may be needed to lift extra rebar from a delivery truck to a bridge deck).

3. Select the Crew Size, Equipment and Materials Needed to Complete the Work

Once you have decided how you're going to build the work and have broken it down into smaller, definable units, then it is simply a matter of selecting the appropriate resources for the work. This selection is based on judgment as well as availability of the needed resources.

4. Estimate Production Rates

Here a lot of judgment is involved and often historical data can be used. Some of the more experienced inspectors may be able to help estimate how long the work will take. Sometimes you

just have to assume a rate. Two things to remember are that no one works a 60-minute hour or less than half a shift.

5. Calculate Direct Costs

Up to this point, we haven't even mentioned costs and yet a lot of analysis has already been done. Good cost estimates are often the result of understanding how to build the work (steps 1 through 4) more than having accurate numbers on costs. On the other hand, don't be afraid to call material suppliers and to use the Contractor's payrolls to improve your accuracy.

Another source of historical cost information is *Means Heavy Construction Cost Data*. This cost guide is published yearly and contains unit cost information as well as information on production rates and crew sizes.

Direct costs usually include project overhead, but not home office overhead. Don't forget incidental costs for things like haul roads, water, and waste disposal.

6. Add Markups and Arrive at a Grand Total or Unit Price

This is the easiest and most straightforward step of all. Sales tax and payroll cost are usually a percentage of the net amount while things like bond, home office overhead, and margin (profit) are a percentage of the gross amount.

This is cost estimating in its most general form. Think of it as a central theme with many variations since the type of work and the needs of the estimator often have a great influence on the way in which the estimate is carried out. Applying these basic steps in order, for even the most complex analysis, will improve your accuracy by keeping you focused on the cost analysis process rather than on the bottom-line result.

Negotiating

Subsection 104.03 and the partnering process should be viewed as a valuable tool to negotiate the contract change amount, if any. If the extra work is not covered by an existing item, the Resident Engineer and the Contractor may be able to negotiate a new unit price for the work and establish a new item or items in the supplemental agreement. If the Contractor proposes a new item or unit price, he or she must provide a detailed cost analysis. The cost analysis should include a breakdown of the estimated time for labor (including labor classifications) and the estimated costs of materials and equipment. The total cost of the extra work is divided by the units of work to arrive at a unit price for the work.

In cases in which it is necessary for the Contractor to submit a cost analysis to support the cost of the change, the Resident Engineer must make a complete review of the Contractor's analysis. The Contractor's analysis should be compared with the RE's analysis. The RE should be completely satisfied that the Contractor's cost analysis is equitable and fair before accepting it as part of the supplemental agreement.

The RE's analysis can be made part of the supplemental agreement instead of the Contractor's if both parties agree.

Some REs think that Contractors try to take advantage of the Department when a change order arises. This is usually not the case. Contractors are no longer in a competitive bid situation after they're awarded the project, so there is no reason for them to assume unnecessary risk. This lack of risk taking is simply reflected in Contractors' change order prices.

Authorization

Authorization Levels

1. Resident Engineers: REs are authorized to approve changes to the contract that do not exceed \$50,000. This authorization will include changes in contract specifications, design and unit price adjustments. Contact and consensus with the both the Project Manager and project designer will be required on design changes that are greater than \$25,000. Project Managers should also be kept informed of all other significant changes. If the RE cannot reach a consensus with the Project Manager and designer on a change, then the issue should be immediately escalated.
2. District Engineer: The DE will have authority to approve changes to the contract that equal or exceed \$50,000 but are less than or equal to \$250,000. This authorization will include changes in specifications, design, and unit price adjustments. Concurrence from the Project Manager and the designer will be needed on all design related changes. In the absence of the District Engineer, the Assistant State Engineer for Construction has this authority.
3. Deputy State Engineer: The Deputy State Engineer will have authority to approve all supplemental agreements that exceed \$250,000 but are less than \$500,000. This authorization will include changes in specifications, design, and unit price adjustments. Concurrence from the Project Manager and designer will be needed on all design related changes.
4. State Engineer: The State Engineer will have the authority to approve all supplemental agreements that exceed \$500,000 but do not exceed \$1,000,000. This authorization will include changes in specifications, design, and unit price adjustments.

When an individual change exceeds 2% of the contract amount, a Resident Engineer or District Engineer may not approve any supplemental agreement without the approval of the Assistant State Engineer for Construction. The RE is responsible for monitoring the cumulative value of all changes to the original contract amount. The RE must verify the project budget can accommodate all supplemental agreement amounts by referencing the Finance Card found in the Contract Card of your FAST Desktop. If not, a Request for Additional Project Funds exhibit 109.04-5 must be submitted and approved by the Assistant State Engineer for Construction.

Contacts For Supplemental Agreements

The authorization levels discussed previously apply to the financial approval of a supplemental agreement. Changes that require alterations to the specifications, ADOT design policy or design details have to be agreed upon by the appropriate ADOT technical section. A change must receive technical authorization before the cost of the change can be approved. The contact must be documented in the Supplemental Agreement Tracking System (SATS) Contract Revision Notification (CRN) screen.

The ADOT technical managers include Valley Project Management, Statewide Project Management,

Value Analysis, Materials, Roadway, Environmental, Traffic Engineering, Engineering Technical Group, Right of Way and Bridge.

If any technical manager does not agree with the proposed Supplemental Agreement, the agreement must be escalated to the applicable Deputy State Engineer(s) for approval.

The District Engineer has authority to approve supplemental agreements for federal-aid projects in the certification acceptance program. Although FHWA does not need to approve these supplemental agreements, they do need to be advised that the supplemental agreement is being processed. FHWA contacts are required on all federal-aid projects not in the certification acceptance program. Any local government or agency participating on a project must also be contacted.

Time Extensions

The District Engineer has the authority to approve all time extensions, whether they are submitted on the "Contractor's Request for Extension of Contract Time" form or whether the issue of time is addressed in a change order. Letters of agreement are not to be used for time extensions.

Escalation of Supplemental Agreements

Should there be an internal lack of consensus on any proposed supplemental agreement, the DE, RE, Project Manager, and the project management team should make every effort to reach a satisfactory solution. If necessary, the issue may be escalated to the Assistant State Engineer for Construction or the Deputy State Engineer, who will then attempt to resolve the issue to the satisfaction of all concerned.

Documentation

Contract Revision Notification Requirements for Supplemental Agreements (See Exhibit 109.04-1)

The purpose of Contract Revision Notification Documents is to provide documentation that details ADOT approvals and Contractor acceptance of contract changes. No payment can be generated until all required approval dates have been entered into the Contract Revision Notification Approvals SATS screen (and saved). This document shall be prepared and distributed within 48 hours of the Emergency Authorization date. The Emergency Authorization date is the date ADOT and the Contractor agree additional work is required. The Contract Revision Notification is important because it documents that authorized approvals for contract changes have been obtained so that work and payment can proceed before a detailed Supplemental Agreement is signed as the official contract document. In cases where exact costs cannot be determined, the Contractor and the Resident Engineer shall prepare a cost estimate and the Resident Engineer shall document the work as if it were a force account until an exact cost can be agreed upon. However, if the exact cost cannot be determined within 10 calendar days, the Contractor and the Resident Engineer shall document the work as a force account. A force account (supplemental agreement or line item) cannot be converted to a change order after the supplemental agreement has been created in SATS and/or payment has been made. A completed formal detailed Supplemental Agreement with exact cost shall be processed within 45 calendar days following the Emergency Authorization date on the Contract Revision Notification.

The Resident Engineer or his designee shall use the SATS program in the FAST Data Base to prepare the Contract Revision Notification Document. The following contacts will be made.

1. The person authorizing the change (see "Authorization Levels" above).

2. The Assistant State Engineer for Construction and the Project Manager if the Supplemental Agreement cost warrants (see "Authorization Levels" above).
3. If the design was modified, the name of the registrant that was contacted as specified under "Sealing Change Orders" below.
4. The person contacted within the appropriate ADOT technical section if ADOT Standard Specifications, Special Provisions, or Standard Drawings were altered (see "Contacts for Supplemental Agreements" above).
5. Contractor's Agent.
6. Federal Highway Administration and local government contacts.

The original will be filed in the project files, with additional copies distributed to the:

1. Contractor.
2. Field Reports.
3. Local Government and/or FHWA as applicable (FHWA must be contacted for Interstate projects > 1 Million).
4. All other contacts specified in the Contract Revision Notification.

Office Procedure For Contract Revision Notification

1. Start the Contract Revision Notification as soon as you know that a contract change will occur. The document will help you identify whom you should contact. A guide to assist in creating CRN's & SA's can be found on the ADOT website @ <http://adotnet/forms/fast/SATSUserGuideRev5.pdf>.
2. As soon as you feel the document is complete, advise the RE for a final edit and for his approval.
3. Print a hard copy of the completed document to place in the file.
4. Send the document to your District Engineer and to Field Reports.
5. When the supplemental agreement document is complete attach a hard copy of the Contract Revision Notification document as the cover sheet. If the cost has changed modify the cost on the Contract Revision Notification document before attaching it to the Supplemental Agreement.

Supplemental Agreement Forms

Immediately following distribution of the Contract Revision Notification Documents, the RE or his designee should proceed with the preparation of the formal supplemental agreement. The completed formal supplemental agreement will be submitted **45 calendar days** following the Emergency Approval date on the Contract Revision Notification.

The text of a change order (Exhibit 109.04-2) consists of:

- the Request (a description of the extra work);
- the Reason for the work;
- a Cost Analysis, showing the method of measurement and the cost effects of the work.

Similarly, the text of a force account work request (Exhibit 1-15) consists of:

- the Request (a description of the extra work);
- the Reason for the work;
- the Pay Item Adjustment, showing the cost breakdown of the estimated labor, materials, and equipment required to perform the extra work.

The RE should also consider using drawings, photographs, and quotations from the specifications or developing unique provisions to make supplemental agreements clearer and more authoritative.

An explanation of rate establishment may also be required on a force account work request if the hourly rate for a particular type of equipment is not covered in the Rental Rate Blue Book for Construction Equipment.

A supplemental agreement is usually signed first by the RE, then sent to the Contractor for signature. Once returned from the Contractor, the supplemental agreement is sent to the District office for approval and / or signature. The supplemental agreement and all attachments are then forwarded to Field Reports for processing.

Letter of Agreements

Letter of agreements will be cosigned by the Contractor. The Contractor's representative must be included on the authorized signature form.

Each letter agreement of authorization will include the following information (see Exhibit 109.04-3):

- The TRACS number, project number and date of authorization;
- Reason for the work authorized;
- The cost of the alteration.

When it's necessary for the Contractor to submit an analysis to support the cost of the change, the Resident Engineer must make a complete review of the Contractor's analysis and be completely satisfied that it is equitable before accepting it and making it a part of the supplemental agreement.

The Resident Engineer's review will be in the form of a completely independent cost analysis, which will be attached to the letter agreement and retained in the project office.

Arizona Department of Transportation
 Intermodal Transportation Division
 Contract Revision Notification

10/08/03

To: R.U.Sure
 District Engineer
 From: I.M. Right
 Resident Engineer

Signature _____

Signature _____

Tracs# H1234501C	Project# I-10-4(001)	Project Name I-10-TI, ANYWHERE		
Contractor Quality Construction Co.	Contract Amt \$11,555,000.00	Contingency % 5 %	Contingency Adjustment % %	Contingency Amt _____
Original Amt \$85,000	Percentage of Contract .74 %	Accumulated Amt \$278,000.00	Accumulated % of Contract 2.41 %	
Agreement Type Change Order	Document Num _____	SATS Doc Num 1004	Emergency Approval Date 10/06/2003	
Prime Designer	Errorless Design Engineering			
Reason Code	Plans, Revisions, and Oversights			

Brief Description

Add a 6" dedicated waterline to the pump station for the fire suppression system.

SA Description

During the construction of the pump station it was determined that the new 4" water line would not supply enough flow to run the fire suppression system. The pressure and flow problems were not determined until after the majority of the 4" line had already been installed. The designer recommended installing an unmetered, dedicated 6" ductile iron line for the fire suppression system.

Name	Title	Date Contacted	Comments
R. U. Sure	District Engineer	10/06/2003	Concurs
M. I. Sane	ADOT Valley PM	10/06/2003	Acknowledged Change
C. Y. Bass	Errorless Design Engineering	10/06/2003	Recommended Change
Y. Knott	Quality Construction Co.	10/06/2003	Contractor's Authorizing Agent
B. Ware	FHWA	10/06/2003	Authorized FHWA participation

**Arizona Department of Transportation
Intermodal Transportation Division
Supplemental Agreement**

12/01/03

Change Order No. 1004

Tracs No.: H1234S01C

Project No.: I-10-4(001)

Org: 7777

Phoenix

Project Name: I-10 TI, Anywhere

Contractor: Quality Construction Co.

Federal Aid

Non-Federal Aid

Request:

To create;
Bid Item No. 8073999 - 6" Tapping sleeve
Bid Item No. 8080039 - 6" Backflow Preventor
Bid Item No. 8082106 - Pipe, Ductile Iron, 6"
Bid Item No. 8089399 - Misc. (Concrete Coring)
Bid Item No. 8089999 - Misc. (City Permit)

Reason:

During the construction of the pump station it was determined that the new 4" water line would not supply enough flow to run the fire suppression system. The pressure and flow problems were not determined until after the majority of the 4" line had already been installed. The designer recommended installing an unmetred, dedicated 6" ductile iron line for the fire suppression system.

Pay Item Adjustments:

Sec	Item Nbr	Description	Unit	Unit Price	Quantity	Amount
1	8073999	6" Tapping Sleeve	EACH	2,000.00	1.000	2,000.00
1	8080039	BACKFLOW PREVENTION ASSEMBLY, 6"	EACH	6,000.00	1.000	6,000.00
1	8082106	PIPE, DUCTILE IRON, 6"	L.FT.	50	1250.000	62,500.00
1	8089399	MISC (Concrete Coring)	EACH	1,500.00	1.000	1,500.00
1	8089999	MISC (City Permit)	L.SUM	13,000.00	1.000	13,000.00

Total **\$85,000.00**

Total Difference	Plus	\$85,000.00	Minus	\$0.00
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Date: _____ Date: _____ Date: _____ Date: _____

Resident Engineer City/County Engineer District Engineer Field Reports

For valuable consideration, it is mutually agreed that the matter detailed above shall be done and payment made as shown herein for a Supplemental Agreement Change Order, all in accordance with the terms of the contract. For work being performed as a Supplemental Agreement Force Account Work Order, final payment shall be made as stipulated in the Standard Specifications and its supplements upon completion of said work.

Date: _____ Date: _____ Date: _____

Approved for: _____ Approved for State of Arizona _____ Approved without Federal participation
Contractor _____ Approved with Federal participation

By: _____ By: _____ By: _____

Arizona Department of Transportation
Intermodal Transportation Division
Supplemental Agreement

12/17/2003

Force Account No. 1

Tracs No.: H541701C

Project No.: AC* 202-C(006)B

Org: 7742

Phoenix

Project Name: SANTAN, I-10/MARICOPA ROAD TI

Contractor: PULICE CONSTRUCTION INC.

[x] Federal Aid

[] Non-Federal Aid

Request:

To compensate the Contractor for extra work necessary to remove and replace unsuitable material.

Reason:

After milling off the existing AC from WB I-10 the Contractor started preparation of the subgrade for placement of the 50% AB - 50 millings mix. The large hauling vehicles started to break down the existing subgrade causing it to pump badly. The subsurface is randomly saturated in both small and large areas and is at optimum moisture. After an inspection by ADOT's Geotech Engineer it was determined that existing material would have to be removed up to 2' in depth and replaced with suitable material.

Table with columns for Section, Labor, Equipment, Materials, Fa Amount, Total Difference, Plus, Minus. Values include 20,000.00, 40,000.00, 15,000.00, \$75,000.00, 75,000.00, \$75,000.00, and \$.00.

Date: _____ Date: _____ Date: _____ Date: _____
Resident Engineer City/County Engineer District Engineer Field Reports

For valuable consideration, it is mutually agreed that the matter detailed above shall be done and payment made as shown herein for a Supplemental Agreement Change Order, all in accordance with the terms of the contract. For work being performed as a Supplemental Agreement Force Account Work Order, final payment shall be made as stipulated in the Standard Specifications and its supplements upon completion of said work.

Date: _____ Date: _____ Date: _____
Approved for: _____ Approved for State of Arizona _____ Approved without Federal participation
Contractor _____ Approved with Federal participation
By: _____ By: _____ By: _____

Arizona Department of Transportation

Intermodal Transportation Division

Supplemental Agreement

12/18/2003

Letter of Agreement No. 2

Tracs No.: H508801	Project No.: AC* 600-7-(1)	Org: 7742	Phoenix
Project name: I-10 TI, PH 2(INCL CHNDLR BLV)		Contractor: EDWARD KRAEMER & SONS, INC.	

- Federal Aid
- Non-Federal Aid

Request:

To compensate the Contractor for removal of reinforced concrete curb from the top ends of Equipment Overpass.

Reason:

This work is necessary to accommodate the roadway section and is not identified in the plans as a removal item. This curb required the use of jackhammers and compressors for removal. Reference subitem 56.

Pay Item Adjustments:						
Sec	Item Nbr	Description	Unit	Unit Price	Quantity	Amount
1	9240101	MISCELLANEOUS WORK (RESIDENT)	L.SUM	1.00	0.000	\$.00
Subitem: LOA56 Unit Price Adjustment:			.00	1.00	761.580	\$761.58
Total:						\$761.58
				Plus	Minus	
Total Difference:					\$761.58	\$.00

Approved for ADOT

Robert J. Samour _____
Date

Approved for Edward Kraemer & SONS, INC.

Contractor Signature _____
Date

cc: Field Reports

ARIZONA DEPARTMENT OF TRANSPORTATION**OFFICE MEMO**

May 8, 2003

TO: JULIO ALVARADO
Assistant State Engineer
Construction Group 172A

FROM: Resident Engineer
Org Name

RE: TRACS #, PROJECT #
PROJECT NAME
Project Location

ORG:

The referenced project requires additional work in order to adequately address the construction needs at this location. Pertinent fiscal information is as follows:

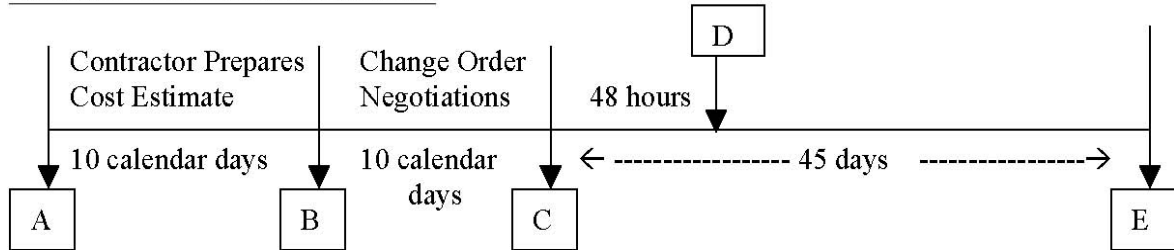
Original contract amount:	\$	1,637,003.74	
Five percent contingency:		34,335.55	
15% CE		103,006.65	
DPS		21,000.00	
Incentives		120,000.00	
Original Available:	\$	1,915,345.94	(Agreement Estimate Recap/Finance Card)
Actual Construction Costs	\$	1,626,342.58	
Actual CE		142,389.74	
Contract Work Remaining		165,000.00	
Additional Supplemental Agreements		98,000.00	
Additional CE Costs		45,000.00	
Proposed New Total Needed:	\$	2,076,732.32	
Less Previous Increases	\$	(25,000.00)	
Requested Amount:	\$	136,386.38	

Reason for increase: (Be specific)

RESIDENT ENGINEER

DISTRICT ENGINEER

Exhibit 109.04-5. Request for Additional Funds

Time line for Contract Modification

- A. Contractor or ADOT agree to additional work that is not included in the contract.
 1. Contractor is asked to prepare a detailed cost estimate or unit prices for the work, and ADOT specifies a reasonable time for the Contractor to complete the estimate. Std Spec 109.04C specifies 10 calendar days for the Contractor to prepare a cost estimate.
 2. If work is required to start prior to "C", ADOT starts documenting the work as if it were force account.
- B. Cost Estimate is received from the Contractor.
 1. Start change order negotiations [see 109.04(D)].
 2. If the cost estimate is not received from the Contractor on time or if a contract price adjustment cannot be agreed upon, the work is processed as a force account and the Resident Engineer will prepare the force account request.
- C. Emergency Authorization Date
ADOT and Contractor agree to proceed as either a change order or force account.
If Force Account then ADOT estimate is required.
- D. Contract Revision Notification Document prepared for a force account or a change order.
- E. Change order is completed and signed as the official contract document.

Sealing Change Orders

Resident Engineers are responsible for sealing change orders only when they have been in responsible supervisory charge of a design issue. Design issues include changes to or the creation of drawings or technical specifications covering the quality or performance of the finished construction work. For example, seals are not required for contract administrative issues such as quantity, cost, and time adjustments.

When the change is to an existing design sealed by registrant, the RE shall coordinate with the registrant. When consulting designers develop changes, they shall send sealed drawings or specifications to the RE for inclusion with the change order. When a value engineering proposal requiring new drawings is submitted, it shall be sealed by the Contractor's registered engineer prior to final approval of the proposal. When an issue has been escalated beyond the Resident Engineer, it shall be sealed by the responsible registrant making the final decision. Drawings and specification must be sealed in accordance with Article R4-30-304(A)(3) of the Code & Rules of the Arizona State Board of Technical Registration.

All change order forms must originate from and be tracked by the RE in the same manner as all other change orders. Any new or revised sealed drawings or specifications shall be attached to the supplemental agreement forms or referenced on the first page of the form.

Force Account WorkProcedures

On a force account the Department has a right to direct the work. In other words, Inspectors, Project Supervisors, and the Resident Engineer can control how the work is performed and what labor, materials and equipment the Contractor uses. They can also decide what to include and exclude on a force account. The Contractor's foreman or forewoman should still retain day-to-day supervisory control over the labor and equipment to ensure their efficient and economical use.

Inspectors must track daily the Contractor's labor and equipment hours as well as the materials used for force account work. The force account daily report form is used to track force account work. A copy of the form is shown in the Force Account Instructions booklet referenced at the end of the chapter.

A copy of the force account daily report is given to the Contractor, who then invoices the Department for the labor, materials, and equipment shown on the daily reports. The field office reviews and approves these invoices per specifications and then pays the Contractor. If charges appear on the detail and are not accompanied by the proper documents, the charges should be removed from the detail before payment is made. Partial payments on force accounts are not allowed. Copies of all approved invoices/details should be sent to Field Reports within five days after payment is made.

Force Account Markups

Hourly payroll labor rates (including the hourly fringe benefit amount) are multiplied by 1.5 to arrive at a gross regular pay rate for labor used on a force account. This 50 percent markup on labor is intended to cover the Contractor's expenses for:

1. payroll taxes,
2. FICA,
3. social security,
4. Medicare,
5. workers compensation,
6. liability insurance, and
7. project overhead and profit (including the administrative overhead for the force account).

No additional markups are allowed for the Contractor's labor costs, even if the Contractor can prove that actual costs for the expenses listed above are greater than the 50 percent markup.

Subsistence and travel allowances paid to the worker are not allowed this 50 percent markup.

Subcontractor work and the costs of materials supplied to a force account are also marked up to offset the Contractor's administrative and handling costs. See Subsections 109.04(D)(2) & (D)(7).

Outside rented equipment is eligible for reimbursement at the invoiced rate plus a 10 percent markup, plus

the hourly operating cost (HOC). [(Rental Invoice X 1.10) + HOC]

Owner-Operated Equipment and Specialized Work

Equipment can be treated as owner-operated only when the person who owns the equipment is the one operating it. For example, if the Contractor hires Joe's Drilling to drill holes for guardrail posts, then Joe has to be the one who operates the drilling equipment, not Joe's cousin or one of Joe's employees. Otherwise, Joe's Drilling is treated as a lower-tier Subcontractor and paid Blue Book rates for equipment and payroll rates, plus fringes and markup for the operator.

To avoid the added administrative expense that occurs when specialized Subcontractors perform force account work, the Resident Engineer is authorized to pay for specialized work by invoice when the value of the work is \$5,000 or less. Contractors are allowed a markup on this invoiced work in accordance with 109.04(D)(7). The specialized work is lumped into all the other subcontract work when determining the markup percentage.

On federal-aid projects, the Contractor still needs to submit certified payrolls for force account work performed by specialty Subcontractors, even when work is invoiced.

Administering Force Accounts

Refer to the ADOT Force Account Instructions booklet for further information on documenting and processing force account work.

Field Reports keeps current copies of the Blue Book as well as past copies for the last five years. Field Reports will actively assist you in determining equipment rates when the need arises.