DELAYS

The non-strike agreement entered into on 9 July 1959, between Morrison-Knudsen Company and Associates and the Northeastern Colorado Building and Construction Trades Council was applicable to all work performed for the United States Army Corps of Engineers on the Titan Missile Project near Denver, Colorado and was instrumental in preventing any major delays due to local walkouts. Man days lost due to local work stoppages totalled nearly 6000. This is very minor considering the contractor's work force at the peak construction period totalled approximately 2000. These local work stoppages were confined to walk offs by small groups and not recognized as strikes by the Unions.

A major delay to Contract DA-5558 was caused as a result of a nationwide steel strike of 114 days beginning 14 July 1959. An additional 30 days time was required for heating up furnaces. Of this total of 144 days the contractor was able to recover 30 days and he was granted a time extension for the remaining 114 days. As a result of the steel strike, the sequence of work for Contract DA-5558 was revised to permit continued operations while awaiting arrival of steel which could not be procured from any source.

Hundreds of modifications involving thousands of changes caused delays which could not be completely recovered. Time extensions for these delays were granted which were compatible with Air Force need dates.

SAFETY

The Titan I ICBM prime construction contracts were awarded to Morrison-Knudsen Company and Associates in 1959. At a pre-construction safety meeting before the start of operations, the potential hazards of underground construction were outlined to the contractor after which the contractor submitted a project safety program to the Area Engineer.

At the appropriate time during the construction, safety nets were installed in the Missile Silos and safety belts, life lines, and protective equipment were provided.

Three fatalities occurred during the life of the project. These were as follows:

a. On 4 December 1959, a pickup truck operated by an M-K&A steel superintendent, traveling on state roads from Complex 2B to Complex 2A was struck broadside by a rural postal truck. The driver was pinned in the pickup and suffered fatal injuries when the pickup burned. All project employees were cautioned to practice defensive driving off the projects as well as on the project sites.

b. A pipefitter caught his thumb between a 20' pipe and the pipe supporting angle iron, crushing the end of the thumb. On the way to the hospital, he went into shock and died from a heart attack. All men were cautioned to keep their hands clear of pinch points when handling materials.

c. The last serious accident occurred on 15 July 1960 when a skip being lowered into a silo dislodged a 2" x 10" x 14' plank from

the top of the silo. A laborer at the bottom of the silo ran out from under protective scaffolding and was killed as the plank struck him on the head. All employees were again instructed to stay under protective covering while lowering equipment or materials in silos. Good housekeeping was rigidly enforced.

The use of safety nets definitely saved several lives. In August 1960, a carpenter fell 90' into a net receiving only minor bruises and returned to work. In January 1961, a pipefitter failed to put on a safety belt and slipped on the top of a silo and fell 70' into a safety net, receiving an ankle injury as his leg hit a scaffold guard rail resulting in 10 days time loss.

After CEBMCO took over supervision 15 September 1960, there were no serious lost time injuries. A qualified full time Safety Officer was appointed and as each phase of the operations developed, a prestudy of potential hazards was made and additional safety measures were incorporated into the Area Safety Program.

PLS safety procedures, including use of approved safety lamps, oxygen breathing units, and emergency rescue and fire fighting equipment were provided for all testing operations as required.

An integrated safety program was developed with Air Force associated contractors and SATAF personnel. The use of safety nets and safety equipment was enforced as long as each project was under the supervision of the Corps of Engineers, even though there were joint occupancy

arrangements with associate contractors.

Silo doors, when open, were bolted to heavy "I" beams secured to the parapet foundation to prevent accidental closing of the doors and these beams remained in place when the projects were turned over to the Air Force.

The following Safety Awards were given at Lowry for the excellent safety record established under CEBMCO operations:

a. The National Safety Council Award of Honor and the Employers Mutual Insurance Company's highest Award of Merit were given to Morrison-Knudsen Co., Inc. and Associates for the record of 1,901,224 injury free man-hours worked from 8 August 1960 to 19 January 1961.

b. A CEBMCO award for the best safety record for Fiscal Year 1961 was presented to Morrison-Knudsen Co., Inc. and Associates on 4 August 1961.

The Lowry Area Accident Experience record compares very favorably with Corps of Engineers averages and after CEBMCO took over, was the best construction record in the history of construction safety records. An accident analysis is presented below.

COMBINED GOVERNMENT AND CONTRACTOR ACCIDENT RATES

	Manhours	Lost Time Injuries	Fatalities	Days Lost	Frequency Rate	Severity Rate
1959	1,443,535	14	1	6,338	10.39	4.39
1960	4,516,590	8	2	12,427	1.77	2.75
1961, 3 Nov	3,016,849	5	0	57	1.66	0.02
	8,976,974	27	3	18,822	3.01	2.10
Since CEBMCO took over 15 September 1960 thru November 1961:						
	4,764,613	5	0	57	1.05	0.01
National Safety Council Heavy Construction averages for 1958 thru 1960;						
					26.42	3.67
N.S.C. General Construction rates 1958 thru 1960:						
					18.11	2.27
Corps of Engineers wide Accident Experience for 1960:						
					5.28	1.47

NOTE: Frequency rate equals number of injuries x 1,000,000 divided by manhours worked. Severity rate equals days lost x 1,000 divided by manhours worked.

To improve overall ICBM construction and operational safety records, a Government Safety Engineer or officer should be assigned with full powers to coordinate and enforce uniform safety programs and procedures for all contractors and agencies involved in construction, installation, and check-out. This would eliminate overlapping and conflicting safety programs and regulations and would greatly reduce the overall cost and should result in better safety records.

FUNDING AND GOVERNMENT COSTS

Costs for the facilities construction by the Corps of Engineers from the period of September 1958 through 16 December 1961 for construction only, excluding land, approached $122 million. This sum includes construction contract costs, supply and service contract costs, Government costs and sub-allotment to other Districts, and purchase orders. The current working estimate at conclusion of the Lowry Area Office was $126,348,000. This estimate contained a reserve for future work, claims, accrued costs, and forecasted costs to completion. Approved Fund Authorization was $124,869,000, of which approximately $3 million was obligated on 16 December 1961.

A summary of the history of current working estimates for the Lowry AFB ICBM construction is as follows:

Date of Estimate	Amount
21 April 1959	$ 89,046,200
18 June 1959	87,020,800
1 September 1959	87,764,800
24 November 1959	93,616,130
22 March 1960	93,041,809
7 June 1960	92,425,509
11 July 1960	101,568,605
30 September 1960	113,745,935
25 October 1960	130,961,703

Date of Estimate	Amount
5 January 1961	$ 118,372,000
18 May 1961	127,869,000
11 September 1961	126,348,000

Total construction contract award from 29 September 1958 to 16 December 1961 was $71,427,806. Total dollar value for negotiated modifications for these contracts was $42,988,607. Total dollar value for overruns and underruns was $278,498. Total construction contract value was $114,694,911. Total dollar value of supply contracts, service contracts, purchase orders and sub-allotments was $345,000. Total denied claims was $1,795,637. Total Government costs as of 31 October 1961 were $6,366,615.

The large increase of CWE from that of $87,020,800 contemplated after award of the two major contracts in June 1959 to that of $126,348,000 on 11 September 1961 was almost completely attributable to the large number of modifications issued for changed and additional work. These modifications were due primarily to research and development and design being accomplished concurrently with construction. Acceleration of work to meet Air Force need dates in lieu of granting justifiable time extensions also contributed to the increased costs. Another reason for the almost continued growth of the CWE was the growth of contract modification costs from that first programmed to that ultimately negotiated. Five typical modifications have been studied with regard to this growth and are summarized beginning on page 62 entitled "Contract DA-5558, Modification Cost Growth Comparison."

The unobligated amount of nearly $3 million of the Approved Fund Authorization of $124,869,000 results from a savings in Government costs of approximately $800,000 due to early phase out, claims budgeted which were subsequently denied, modifications being negotiated at sums less than programmed for, and from new work anticipated but not directed at the time of phase out of the Lowry Area office.

All contract work was completed on or ahead of scheduled completion dates under the contracts and no liquidated damages were assessed on any contract.

16 December 1961

Settled Mod.	Overruns Underruns	TOTAL
8,528	$ 5,181	$ 307,709
-1,659	10,398	423,281
170,526	15,694	411,452
,454,725	109,189	66,231,948
,058,789	125,628	44,129,237
19,816	918	1,318,998
251,330	-2,163	1,394,569
23,045	13,653	345,054
3,507	- - -	128,267
,988,607	$ 278,498	$114,694,911

16 December 1961

	Supply Contracts	Sub-Allotments & Purchase Orders	Government Cost
			(10/31/61)
	*	*	$6,366,615
	$ 265,843	$ 79,738	7,268,726
	*	*	$ 902,111

. . .$4,496,769

. . .$3,081,146

CONTRACT DA-5558, MODIFICATION COST GROWTH COMPARISON

Modification No. 1 was for major changes to powerhouse and equipment, propellant loading system and propellant terminal as well as numerous design changes and correction of errors in plans and specifications which resulted in changes to processpiping; propellant loading system; process piping fuel system, propellant loading system (fuel) instrumentation; installation, preparation and testing of propellant loading system (fuel system); mounting of incandescent and fluorescent light fixtures; fire protection system; standardized equipment; flexible hoses; fuel and LOX cribs; reinforcing steel; steel members and framing for powerhouses, columns in propellant terminals; pump platforms; added high strength steel in features of work; added radiation plates in fuel and LOX tunnels; added alarm system; increased electrical transformer capacity and revised motor control centers.

CONTRACTOR'S PROPOSAL:	Original	$7,803,263
	Revised	$4,937,373
PROGRAMMED OR COMMITTED BY GOVT.	Original	$ 500,000
	Revised	$4,937,373
ORIGINAL A/E ESTIMATE:		$ 47,362

This was raised in increments to a final figure of $1,811,958

Addendum No. 2, dated 17 March 1959, to Invitation No. ENG-24-066-59-73, stated, in part, "SC-2A. Major revisions to the Power House, Propellant Terminal and Propellant Loading System made during

the advertising period have been accomplished by the reissue and addition of a minimum number of contract drawings. In order that no delay in award and shortening of construction times will be necessary, all other drawings effected by the indicated changes are revised only by reference to the reissued drawings. ...These revisions to the contract drawings will not be considered as a change or extra within the intent of the changes clause of the contract and no time extension, delay or changes in contract price will be allowed because of these revisions."

Subsequent to award of the contract, the Architect-Engineer revised the drawings that were referred to as "revised only by reference" in Addendum No. 2, and in addition made numerous other revisions to drawings. To separate the two types of drawings the Architect-Engineer placed a category designation on each drawings. Category 1 designation on drawings meant that such drawing was intended to clarify the basic contract drawings under the provisions of Addendum No. 2, referenced above; Category 3 was assigned to those drawings containing Mod. 1 changes, and such were marked with a symbol M/1; and Category 2 indicated combination of categories 1 and 3.

The categories assigned to the drawings by the Architect-Engineer were immediately questioned by both the contractor and the Area Office. After several reviews and conferences, it was determined that the Architect-Engineer had utilized the Modification 1 instrument to revise certain drawings over and above the intent of Addendum No. 2. In a

conference held 21-22 September 1959, it was determined that the extent of these revisions would have to be reviewed for reassignment of category designation, so there could be a basis for agreement between the Area and Contractor as to category assignment. It was on this basis and a legal interpretation of Addendum No. 2 that both parties developed their respective take-offs.

The Contracting Officer personally attended negotiation sessions to effect final settlement.

Modification No. 7 provided a shock mounted floor in equipment terminals. Requirements included lowering wall depth and base slab to accommodate shock-mounted floor. Additional excavation also was required due to increase in outside overall dimension to accommodate shock-mounted floor. Nine terminals were involved.

CONTRACTOR'S PROPOSAL:	Original	$ 803,689
	Revised	$ 637,127
PROGRAMMED OR COMMITTED BY GOVT:	Original	$ 225,000
	Revised	$637,127

On or about 10 June 1959, the Area Engineer received three preliminary drawings showing proposed method of shock-mounting equipment, Terminal Level I. These drawings 84-S-2, 10, 11 (Ellsworth Air Force Base Tech Facility) showed a section through the terminal and framing plan of Level I, and some of the details for the shock-mount assembly. This was the extent of the information available from these preliminary

drawings with a preliminary estimate of $55,000 for each Equipment Terminal.

On 27 August 1959, a set of signed Modification 7 drawings were provided. These drawings constituted the basis for the final estimate of $71,015 per Equipment Terminal.

Differences between Modification as shown on preliminary drawings and modification as shown on final drawings and specifications:

GENERAL: Examination of the number of drawings used for preliminary estimate and the number issued finally showed the increased scope of the final issue. In detail, some of the differences are:

ARCHITECTURAL: No architectural drawings were issued for preliminary estimate. Architectural items figured for final estimate included additional wall panels, toilet doors, closure for rattle space and floor grounding (changed by specs also not issued for preliminary.)

STRUCTURAL: Final drawings showed more work than shown on preliminaries, such as greater depth of excavation, greater thickness of foundation slab, larger quantity of reinforcing steel, more intricate detailing of shock-mount assembly, and various additions to other levels in the Equipment Terminal.

MECHANICAL: No drawings or specs were issued for preliminary estimate. Five drawings and specs were issued for final estimate. Major change by spec under Modification 7 involved three sump pumps which required redesign for new conditions. Other changes shown on

final drawings included A/C ducts on Level II, sump and other plumbing changes, all of which were not anticipated on preliminary estimate. Pipe sleeves were added for all levels in Equipment Terminal for various piping.

ELECTRICAL: Despite lack of information for electrical work on preliminary estimate, a figure of $1,800 was used. A final figure of $2,144 was negotiated. The two figures, merely by happenstance, were reasonably close.

SUMMARY: The preliminary estimate, from information given, did not nor could not anticipate the larger scope of architectural and structural work shown in the final drawings. The preliminary estimate did not anticipate any mechanical spec changes but for some reason did anticipate a certain amount of electrical work. Some of the changes under Modification 7 were not directly caused by shock-mounting Level I, but were put into the modification by the Architect-Engineer for reasons unknown.

Modification No. 28 was for redesign of upper portion of Missile Silo including doors, re-steel, pump platform door foundation, door buttresses and hinges; piping and pipe supports; additional electrical conduits for elevators and additional telephone facilities.

CONTRACTOR'S PROPOSAL:	Original	$1,335,862
	Revised	$ 705,627
PROGRAMMED OR COMMITTED BY GOVT:	Original	$ 99,000
	Revised	$ 705,627

First drawings for modification were received by the District Engineer, Omaha on 6 November 1959, transmitted to the Area and issued to the Contractor on 13 November 1959 to permit advanced planning for procurement of reinforcing steel. Additional drawings and specifications were mailed to the Area from the District Engineer, Omaha on 17 November and issued to the Contractor In 19 November. These dates were significant because the Using Service had been advised that Modification No. 28 should be received prior to 1 November 1959 to avoid construction delays. Funding estimates were not prepared by the Using Service and time did not permit preparation of an estimate by the two estimators then available to the Area Office. A funding estimate of $99,000 was established administratively.

Modification No. 28 was further revised after 19 November 1959 and the funding request was not reviewed with each revision. Some revisions were significant. One, for example, resulted in scrapping approximately 80 tons of previously fabricated steel. Other changes, including those within the original issue, required scrapping $177,191 worth of miscellaneous metal anchors which had been fabricated and partially delivered to the job site.

As finally issued and revised, the modification consisted of the following:

a. Redesign of upper portion of missile silo, including doors and all their appurtenances, re-steel, pump platform door foundation, door buttresses, hinges and miscellaneous metals. Many of

these items were wholly or partially fabricated when the modification was issued, thereby causing considerable scrapping of steel and forms.

b. Piping and pipe supports were redesigned. Some spools had been fabricated causing respooling in some cases.

c. Electrical changes consisted of additional conduits for an elevator system, additional telephone facilities and changes caused by piping changes.

The contractor submitted his first proposal for Modification No. 28 by letter dated 6 April 1960. This proposal totaled $1,335,862. The proposal contained large amounts for the reinforcing subcontractor, Meehlis Steel Company, and for the supplier of structural steel and miscellaneous metals, the Mosher Steel Company.

A final negotiation was held on 7 November 1960. At this meeting, the contractor agreed to accept the $393,984.66 contained in Supplement No. 2 to Modification No. 28 as final payment for reinforcing bar changes made by Modification No. 28. He also presented a revised proposal reflecting his re-evaluation of the scopeof work. This total proposal, including appropriate mark-ups, was $705,627, which is less than the Government estimate dated 21 September 1960 of $714,628.

Modification No. 56 was for revision of PLS testing requirements.

CONTRACTOR'S PROPOSAL:	Original	$1,803,906
	Revised	$ 717,676
PROGRAMMED OR COMMITTED BY GOVT:	Original	$ 434,538
	Revised	$ 717,676

This modification was first discussed at the Lowry Area on 21 April 1960 by representatives of Ballistic Missile Division. The exact scope of work was not established at that time; BMD did not authorize the change to be issued and no estimate had been prepared.

On 15 November 1960, the Titan I Director advised the Air Force Ballistic Missile Center that revised PLS testing costs were estimated at $720,000 to $900,000 per squadron at Lowry.

On 2 December 1960, a detailed estimate was prepared in Denver by joint effort of the Lowry Area, Titan I Directorate, and SATAF personnel totaling $1,328,392 for the two Lowry Squadrons or $664,196 per squadron.

On 14 December 1960, a conference was held at BMC which resulted in a reduction of the estimate of 2 December to $869,078 for two squadrons. This reduced estimate was used as the funding estimate for modifications issued to the Contractor on 23 December 1960. It was divided to obtain the funding for Modification No. 156 as $434,539.

Seven revisions were issued to the modification between 3 January 1961 and 3 May 1961. The contract negotiations for Mod 156 resulted in a settlement on 15 May 1961 in the amount of $717,676.

Modification No. 171 was for revisions to pipe supports in the Propellant Terminal, interconnecting tunnels and Missile silos; also upper steel framing in the Propellant Terminals. This modification

provides supports necessary to withstand thermal shock loading and provide a safe and operable loading facility

CONTRACTOR'S PROPOSAL:	Original	$2,930,869
	Revised	$2,123,750
PROGRAMMED OR COMMITTED BY GOVT:	Original	$ 780,447
	Revised	$2,123,750

The modification was issued in five parts as designers completed increments of their work. Estimates were hurriedly prepared for each increment to program funds. Plans were not complete. Revisions in pipe supports were made by designers in the field as work progressed, hence funding estimates could not cover the entire scope of work.

Negotiations for this modification were begun with the Government estimate dated 24 March 1961 of $1,346,523 and the Contractor's proposal, transmitted by letter dated 3 April 1961, totaling $2,930,869.

The scope of the work involved several subcontractors and materials suppliers as well as prime contractor forces. Negotiations were conducted first with subcontractors and materials suppliers and followed by discussions of prime contractor work.

On 4 May 1961, the prime contractor advised that he had reviewed their proposal and also reviewed the time being spent in pipe support installations. As a result of this review and the negotiations with subcontractors desceibed above, he orally reduced his proposal to $2,404,217. This quotation was still considerably above the Government estimate. During this same time, however, Government personnel were

observing job performance and had determined the necessity to increase the manhours contained in the Government estimate.

In May 1961, the Contractor and Government representatives met and agreed upon labor rates which were applicable as a result of union agreements which became effective on 1 April 1961.

On 16 May 1961, the Contractor further reduced his proposal to $2,123,750. This reduction was accomplished by

a. Reducing the manhours of labor

b. Deleting entirely an item of $96,016 for "Miscellaneous Complex road maintenance, mobilize additional equipment, etc."

c. Reduced equipment support item

d. Reduced amounts for carpenter support; clean up scaffolding prior to JOD.

The Government estimate had been revised to increase direct labor hours and equipment and indirect labor proportionately; to adjust for the 1 April 1961 wage rate increases; and to include the cost of temporary covers for the propellant terminals and missile silos. The Government estimate of 16 May 1961 totaled $2,143,714.

CORPS OF ENGINEERS BALLISTIC MISSILE CONSTRUCTION OFFICE (CEBMCO)

On 1 August 1960, the Department of the Army established, through its Construction Agency, The Corps of Engineers, a central command in Los Angeles to accomplish the ICBM construction assignment of the U. S. Army. The new organization was called the Corps of Engineers Ballistic Missile Construction Office (CEBMCO - pronounced "see-bem-ko.")

CEBMCO was given the responsibility for construction of missile facilities for two types of Titan, three of Atlas and one for the Minutemen. Such centralized control assured uniformity of construction, of administration of Government contracts, and of attacking and solving challenges inherent in the program. This was necessary to accomplish the ultimate goal, construction of missile sites, at the earliest dates possible, and at fair prices to the Government.

Before the establishment of CEBMCO, construction of ICBM sites was the responsibility of those Corps of Engineers Districts in which the projects were physically located. Construction of the Lowry AFB Titan Squadrons formerly was under the Army Engineers Omaha District, Omaha, Nebraska. With the activation of CEMBCO, the Denver Area was transferred from the Omaha District to CEBMCO command and renamed the Lowry Area. The Omaha District, like other Corps of Engineers Districts, formerly having missile base construction work, continued to provide the Lowry CEBMCO Area with those services which could be most quickly and economically furnished from its office.

CEMBCO established uniform procedures for administration of contracts for each weapon system under construction, through a Weapons System Director at CEBMCO Headquarters and by the CEBMCO Area Engineers at each missile site. Uncer CEBMCO authority and responsibility were decentralized to the maximum degree, consistent with need. At the same time the Weapons System Directors and the Area Engineers provide each other with information as to any changes or conditions within a system and at any site which has possible impact upon the work at any other site or system.

On 1 April 1961, CEBMCO was placed under operational control of the Ballistic Systems Division (BSD) of the newly-organized Air Force Systems Command (AFSC.) Brigadier General Alvin C. Welling, (now Major General), CE, Commanding General of CEBMCO, was assigned as Deputy for Site Activation in BSD. Colonel Thomas J. Hayes, CE, was designated Commander of CEBMCO.

SQUADRON I CONSTRUCTION COMPLETION

The heavy construction phase of the Nation's first Titan I ICBM Operation Squadron, Lowry Air Force Base, was completed on 4 August 1961 and the multimillion dollar project was turned over to the U. S. Air Force.

Transfer of the launching complexes, Squadron I, Lowry, was made at a brief ceremony held at the Town House restaurant, Aurora, Colorado. Presentation of the completed work was made by Mr. J. A. Gibson, Project Manager for Morrison-Knudsen Co., Inc. & Associates, holders of the construction contract. Colonel Joe A. Clema, U. S. Army Corps of Engineers, Area Engineer and Contracting Officer accepted the job from the Contractor and turned it over to the United States Air Force.

Dignitaries attending the ceremony were headed by the Honorable Stephen L. R. McNichols, Governor of the State of Colorado, and the Honorable Henry W. Allard, Mayor of the City of Aurora, Colorado.

Turnover of construction of the Nation's first completely underground ICBM squadron represented a major milestone in the program. It also set a record for high speed construction. Army Engineers awarded the Lowry Titan I contract on 17 April 1959 to the joint venture associates of Morrison-Knudsen Company, Inc., Boise; Paul Hardeman, Inc., Los Angeles; Johnson, Drake & Piper, Inc., Minneapolis; Olson Construction Company, Lincoln, Nebraska; and F. E. Young Construction

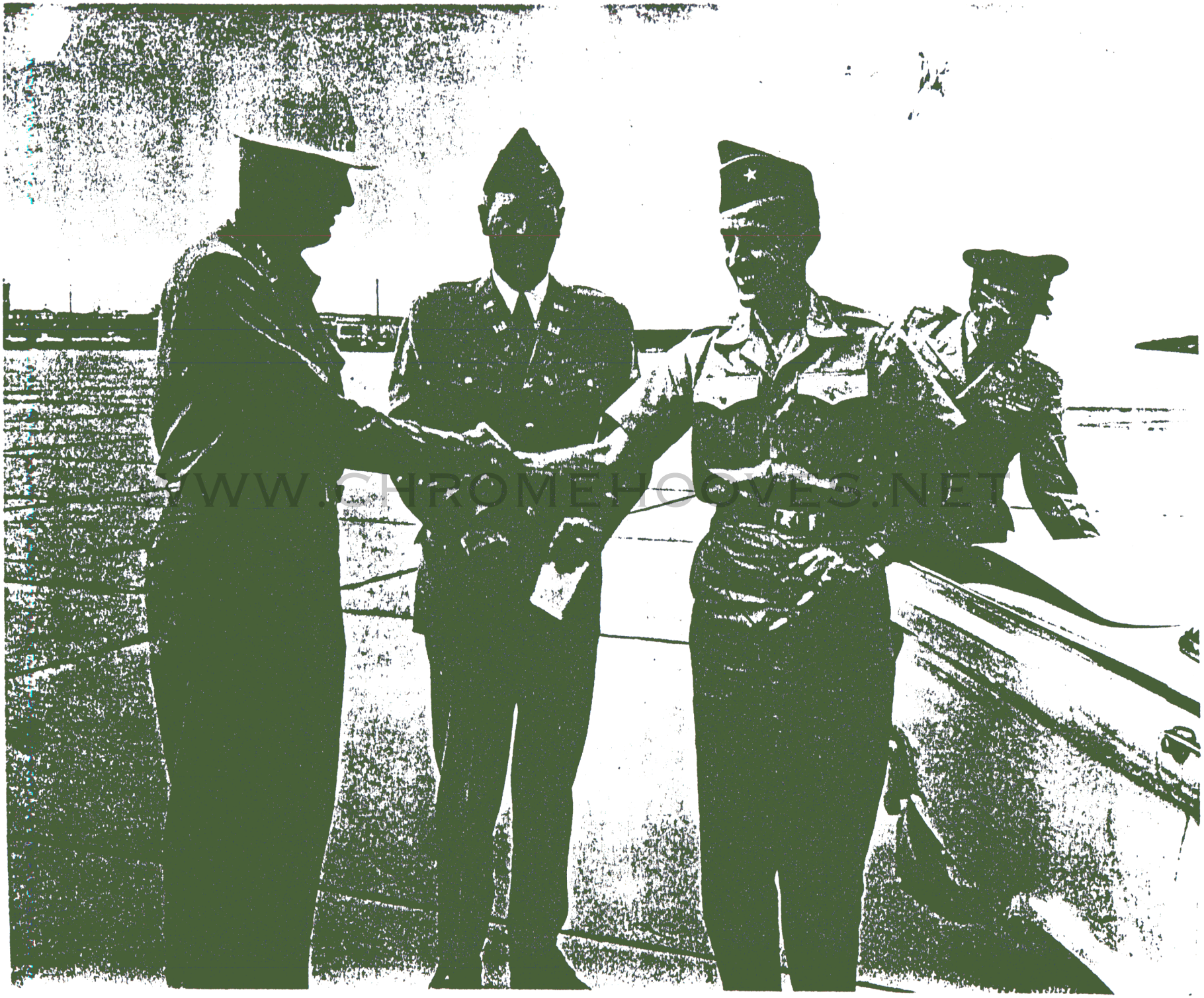
Company, St. Louis. The job was finished on schedule in just a little over two years.

Working around the clock, men and machines moved approximately two million cubic yards of earth, placed 100,000 cubic yards of concrete and 70 million pounds of various types of steel. This construction achievement took on added luster due to the distance factor as the base is sited within an area the perimeter of which is over 175 miles of sagebrush land.

PATRIOTIC CIVILIAN SERVICE AWARD

The major prime construction contractor, Morrison-Knudsen Co., Inc. & Associates, was recommended for and received the Certificate of Appreciation for Patriotic Civilian Service from the Secretary of the Army and the Chief of Engineers. This award was presented to Mr. Bert Perkins, Los Angeles District Manager, Morrison-Knudsen Company, by Colonel Thomas J. Hayes, Commander, CEBMCO at a brief ceremony at the Kearney Motor Hotel, Denver, Colorado, on 30 November 1961. The citation read as follows:

"For outstanding performance from April 1959 to November 1961 while under contract to the United States Army Corps of Engineers for construction of the Air Force Titan I ICBM Facilities at Denver, Colorado. The superior degree of professional and managerial competency displayed by the members of this organization resulted in a high quality of construction and a timely performance despite the numerous and extensive changes and unique preparation required for the accomplishment of unprecedented construction. This outstanding performance which was completed on schedule with a remarkable safety record, reflects the highest credit upon the management and personnel of this joint venture and represents a patriotic civilian service contributing to the military mission of the Corps of Engineers in the national defense."



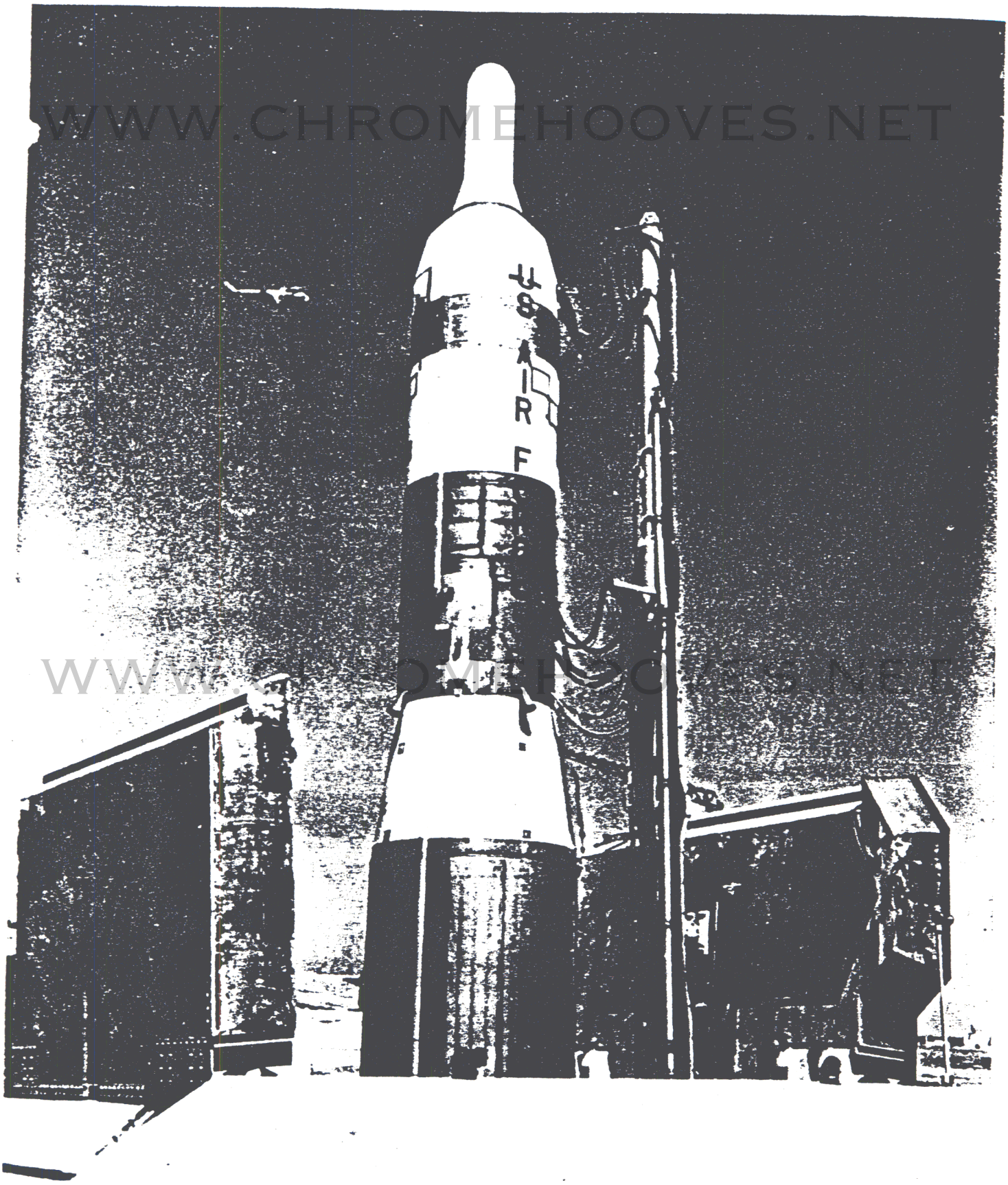
VISITS TO LOWRY AREA

Many visits were made to the Lowry Area during the period of construction. The most important of these are listed below:

Name	Agency	Date
Maj. Gen. K. R. Barney	Missouri River Division	11 May 59
Maj. Gen. K. R. Barney	Missouri River Division	22 Jul 59
Maj. Gen. K. R. Barney	Missouri River Division	22 Sep 59
Maj. Gen. W. K. Wilson Jr.	Office Chief of Engineers	Mar 60
Maj. Gen. K. R. Barney	Missouri River Division	15 Mar 60
Lt. Gen. E. C. Itschner	Chief of Engineers	10 Sep 60
Brig. Gen. A. C. Welling	Commanding General, CEBMCO	10 Sep 60
Messrs. Brent & Chapman	House Subcommittee on Appropriations	Oct & Nov 60
Brig. Gen. A. C. Welling	Commanding General, CEBMCO	11 Nov 60
Gen. L. L. Lemnitzer	JCS Chairman	10 Feb 61
Col. W. S. Rader	JCS	10 Feb 61
Gen. T. D. White,	USAF Chief	10 Feb 61
Vice Adm. U. S. G. Sharp	Navy Deputy Chief	10 Feb 61
Adm. A. A. Burke	Navy Chief	10 Feb 61
Gen. G.H. Decker	Army Chief	10 Feb 61
Maj. Gen. F. L. Wiesman	Marine Deputy Chief	10 Feb 61
Gen. D. M. Shoup	Marine Chief	10 Feb 61
Lt. Gen. J. K. Gerhart	USAF Deputy Chief	10 Feb 61
Lt. Gen. B. Hamlett	Army Deputy Chief	10 Feb 61
Lt. Col. E. N. Kohrman	USAF Project Officer	10 Feb 61

Name	Agency	Date
Mr. E. M. Zuckert	Secty. of the Air Force	24 Feb 61
Maj. Gen. T. P. Gerrity	Commander BMC	24 Feb 61
Brig. Gen. H. W. Powell	AFBMD (ARDC)	24 Feb 61
Col. A. J. Wetzel	Director WS-107 A-2	24 Feb 61
Col. J. C. Ledford	BMC	24 Feb 61
Lt. Gen. W. K. Wilson Jr.	Chief of Engineers	7 June 61
Brig. Gen. A. C. Welling	Deputy for Site Activation BSD	7 June 61
Col. T. J. Hayes III	Commander, CEBMCO	7 June 61
Col. T. J. Hayes III	Commander, CEBMCO	1 Aug 61
Hon. S. L. R. McNichols	Governor of Colorado	4 Aug 61
Hon. Henry Allard	Mayor of Aurora, Colorado	4 Aug 61
Col. T. J. Hayes III	Commander, CEBMCO	30 Nov 61

In addition to the above frequent visits were made to the Lowry Area as required by Colonel C. H. Whitesell, Director, Titan I Construction Directorate, CEBMCO.



USAF Photo - Missile Silo doors open, the TITAN missile is lifted to firing position along with its umbilical lines and tower.