XVIII-13-1B

U. S. ARMY CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
LOS ANGELES, CALIFORNIA

C E B M C O

HISTORICAL SUMMARY REPORT

OF

MAJOR ICBM CONSTRUCTION

BOOK 3

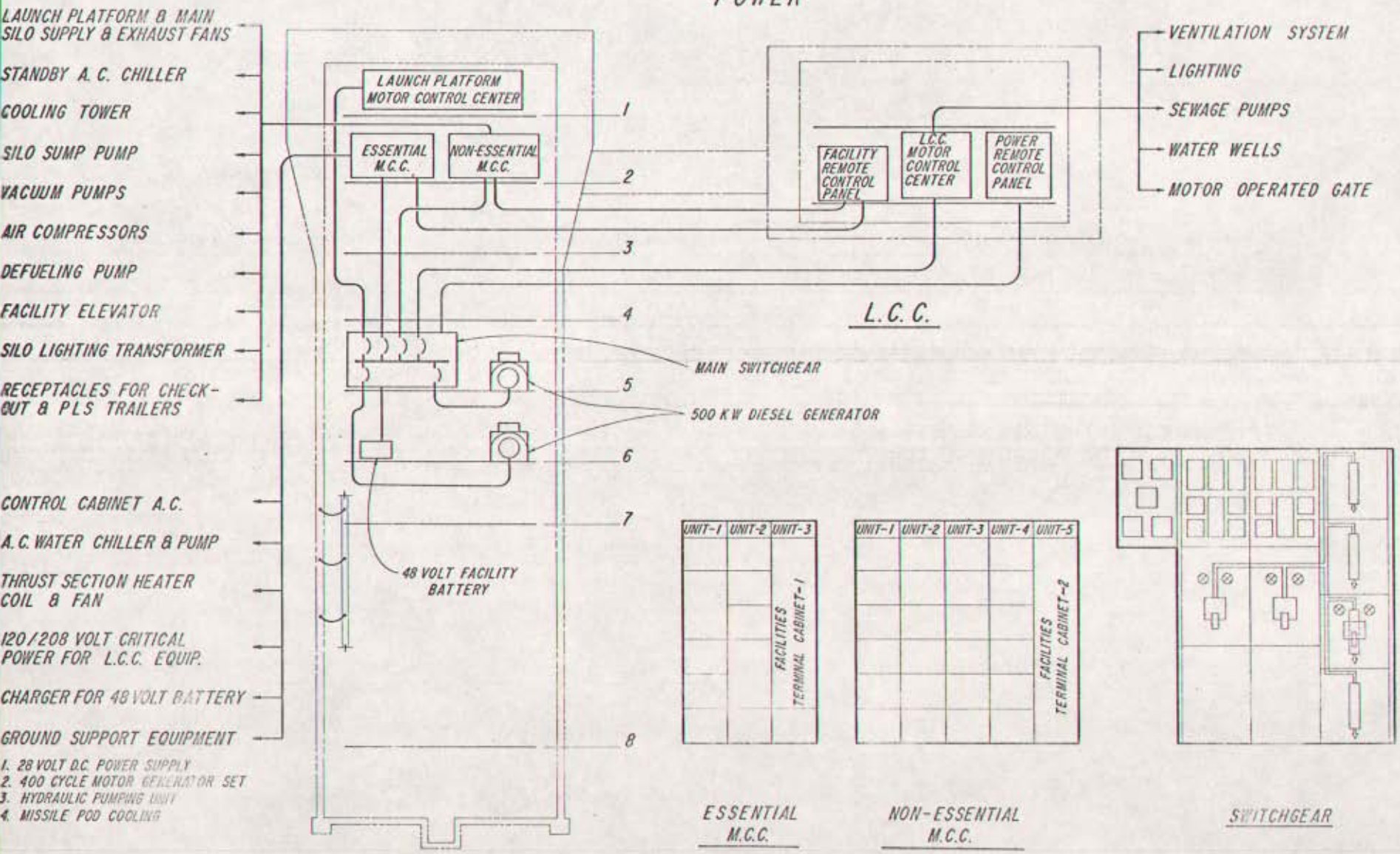
LINCOLN AREA

ATLAS "F"

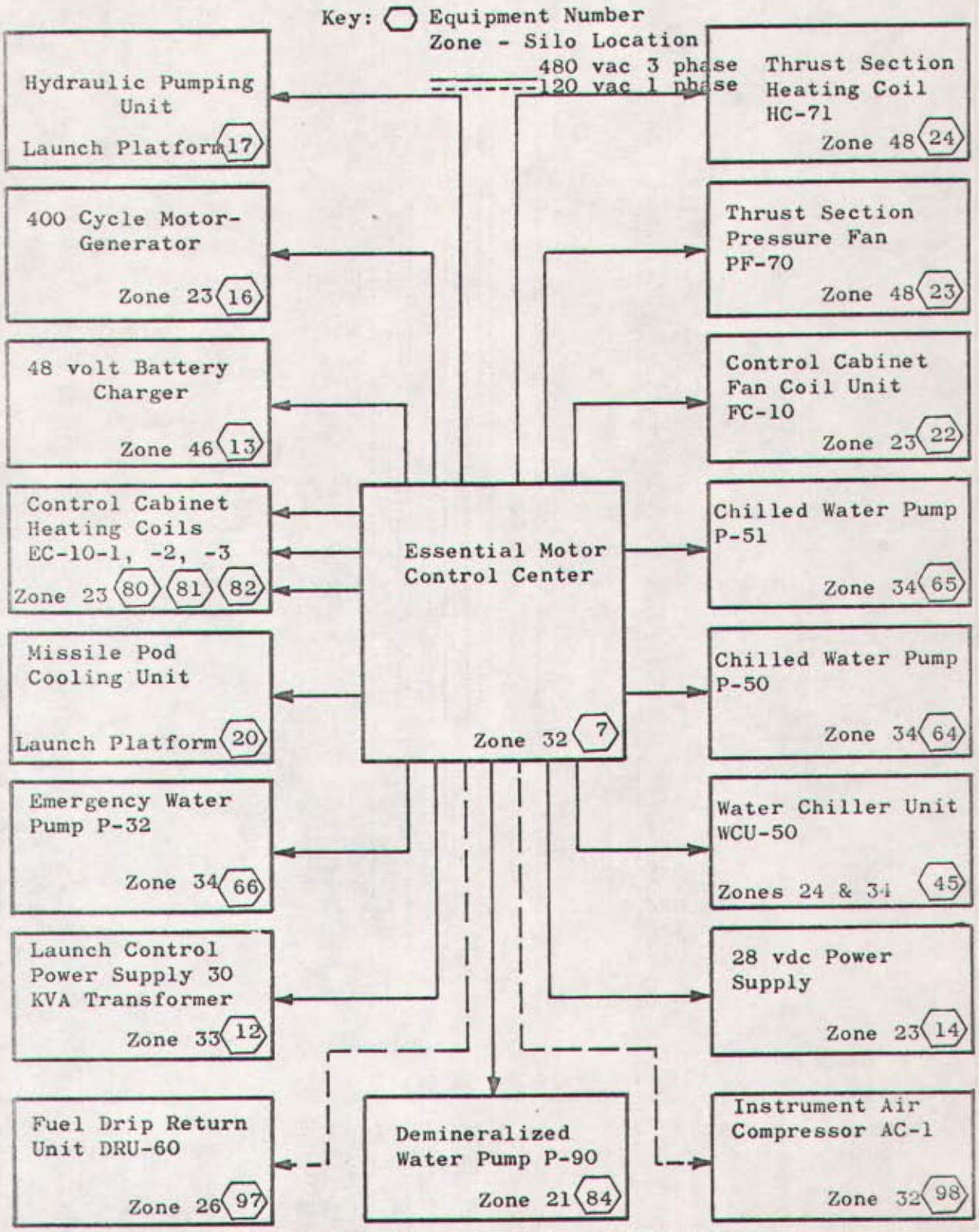
FOR OFFICIAL USE ONLY

ELECTRICAL RISER DIAGRAM

POWER



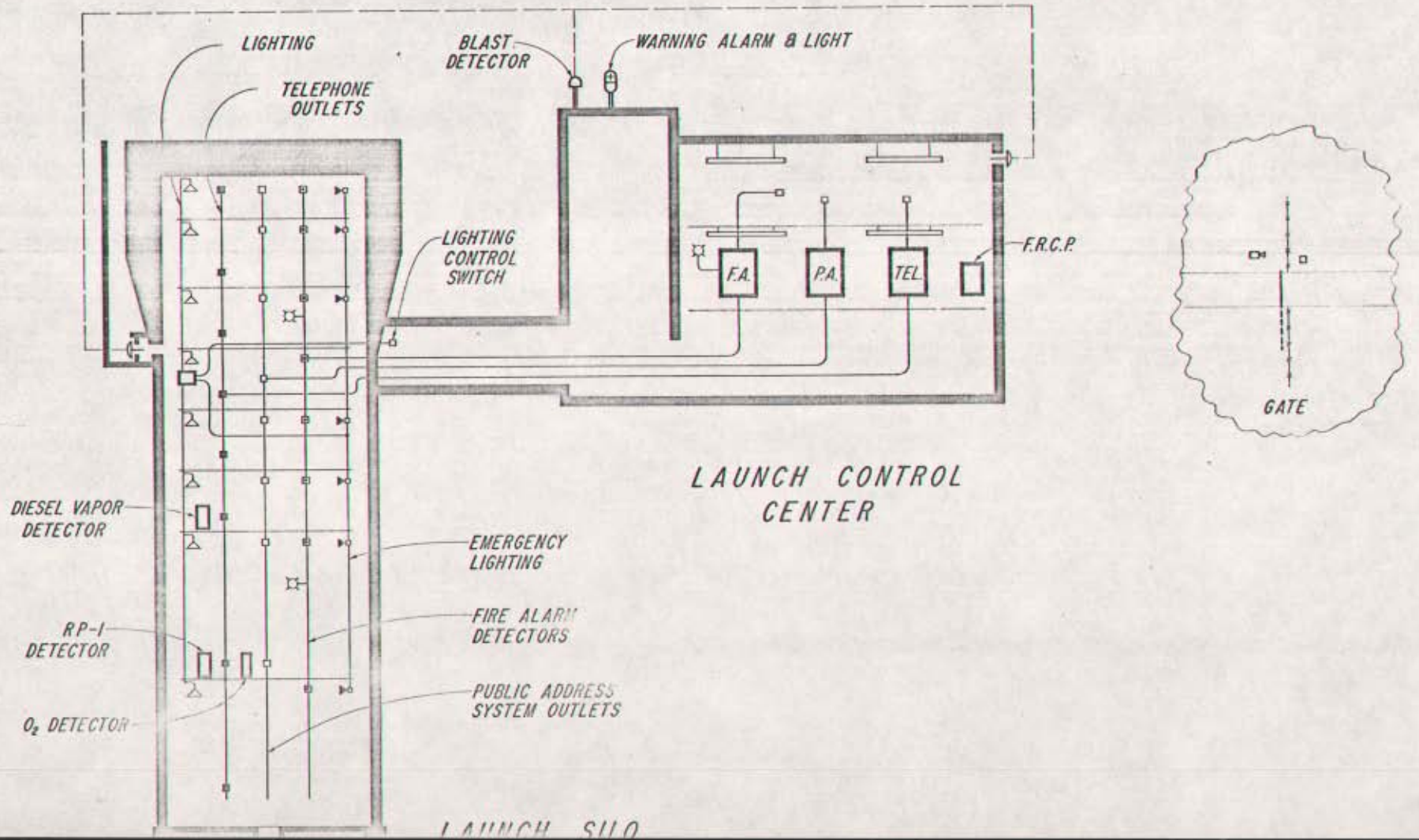
5 June 1961



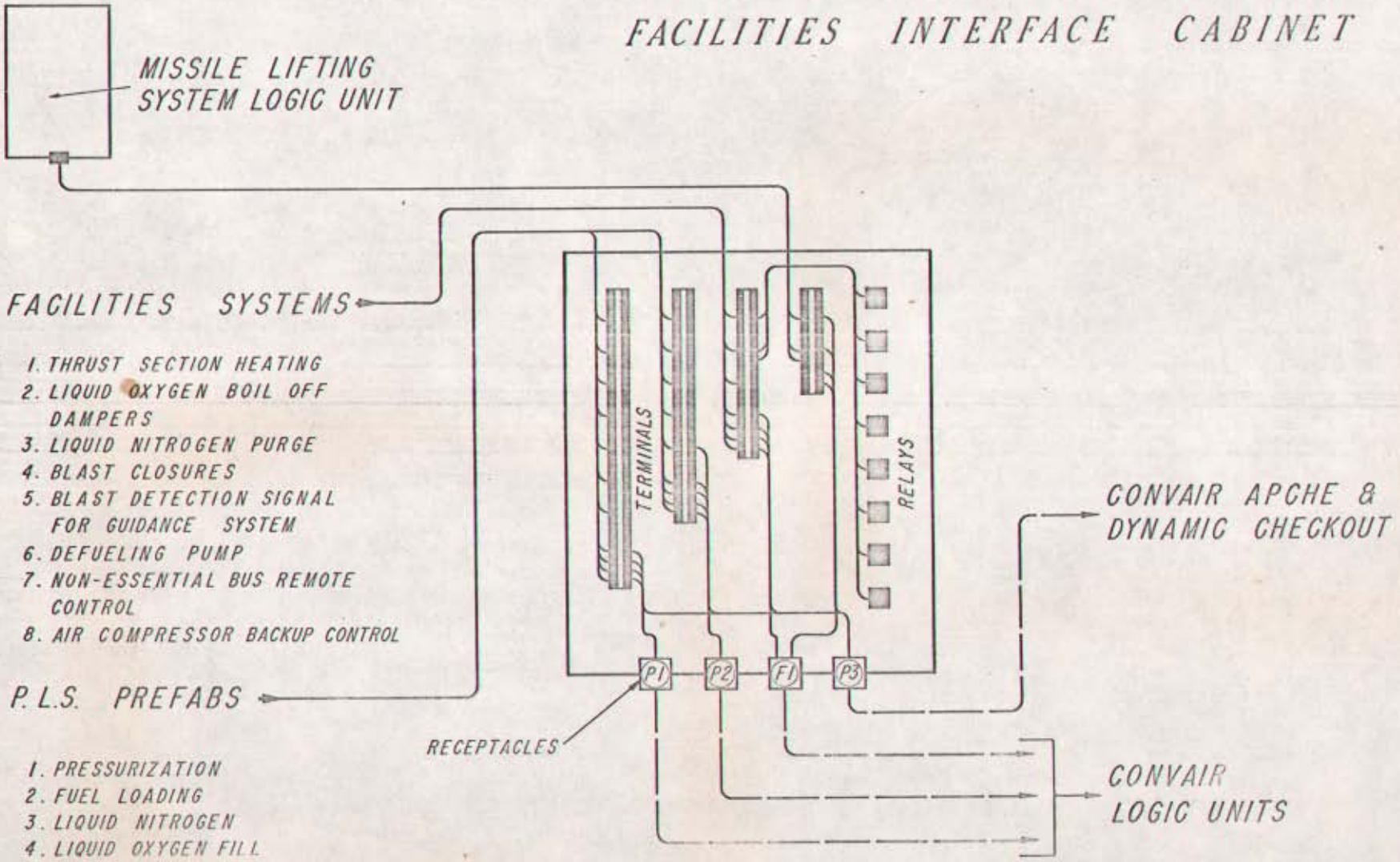
Silo Power Distribution (Essential)

ELECTRICAL RISER DIAGRAM

LIGHTING, COMMUNICATIONS AND DETECTION DEVICES

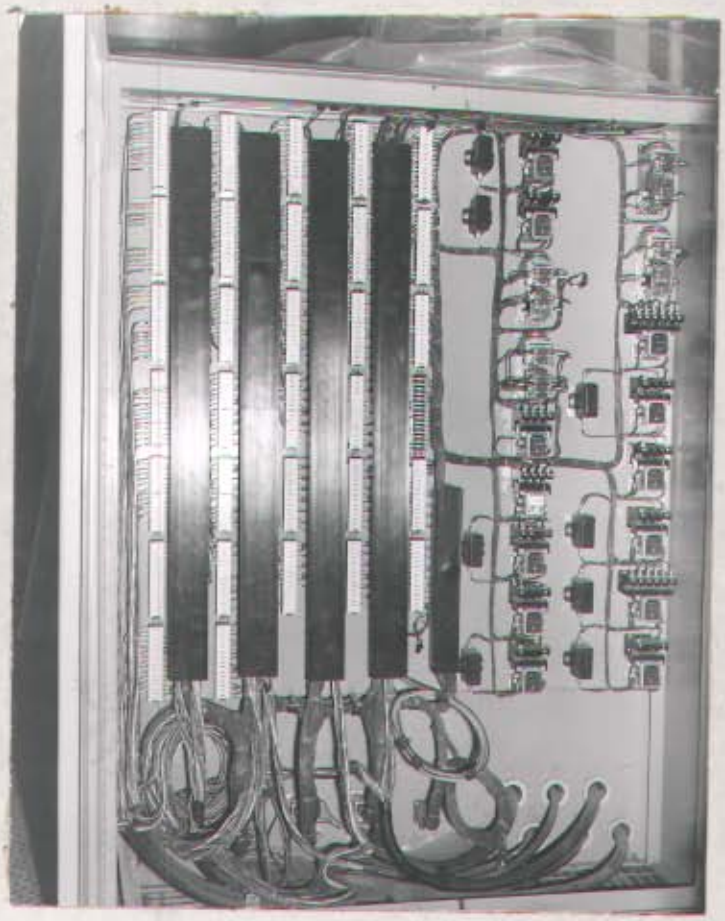


FACILITIES INTERFACE CABINET



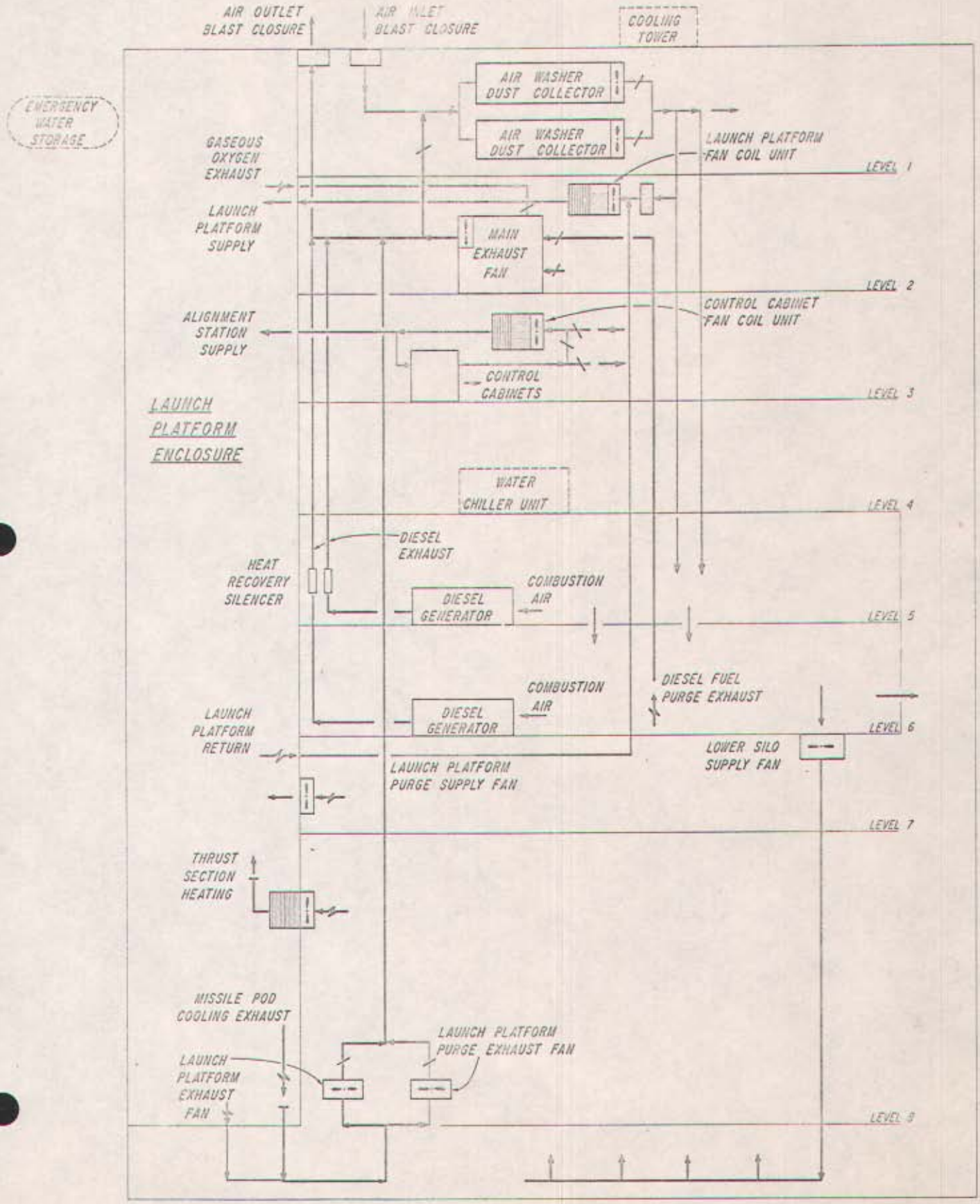
Facility Interface Cabinet:

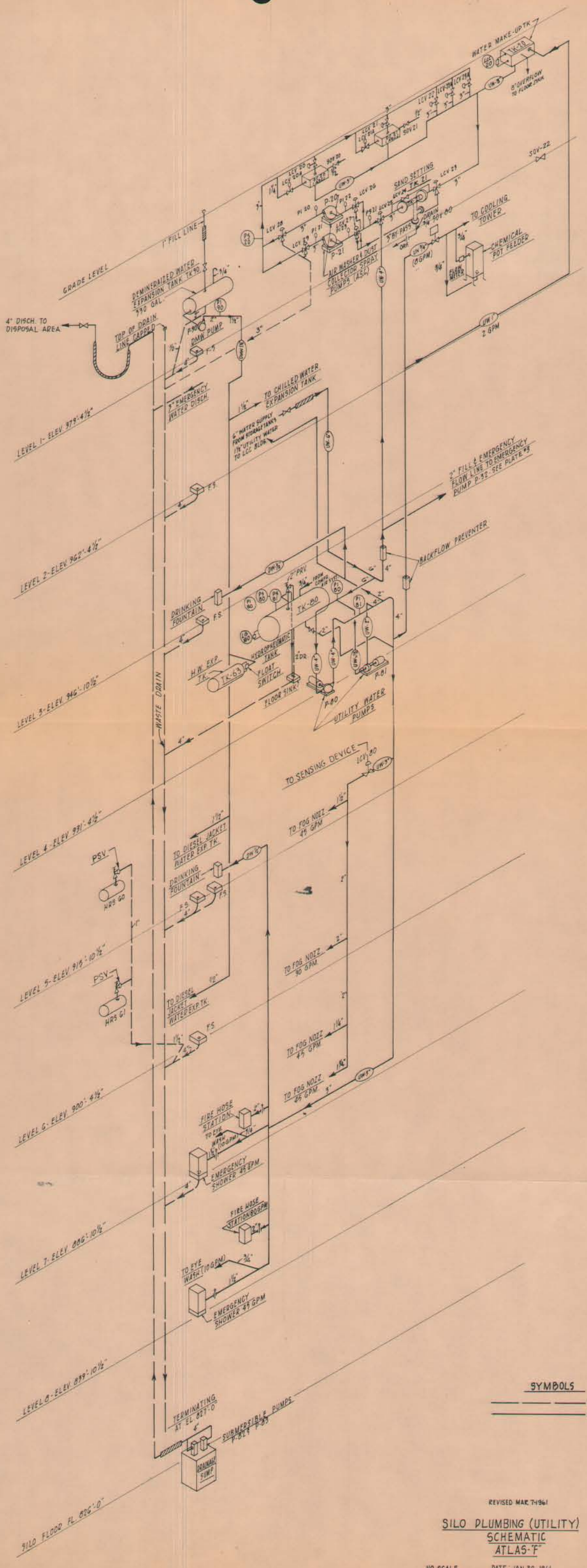
View of Interface Cabinet, located on level 3, doors closed.



View of same cabinet, doors open. Left portion has the terminal strips with cables from various facility units (see diagram, next pages) entering from the bottom. Relays are to the right. The eight dark objects at right are the suppressors.

HEATING, VENTILATING & AIR CONDITIONING

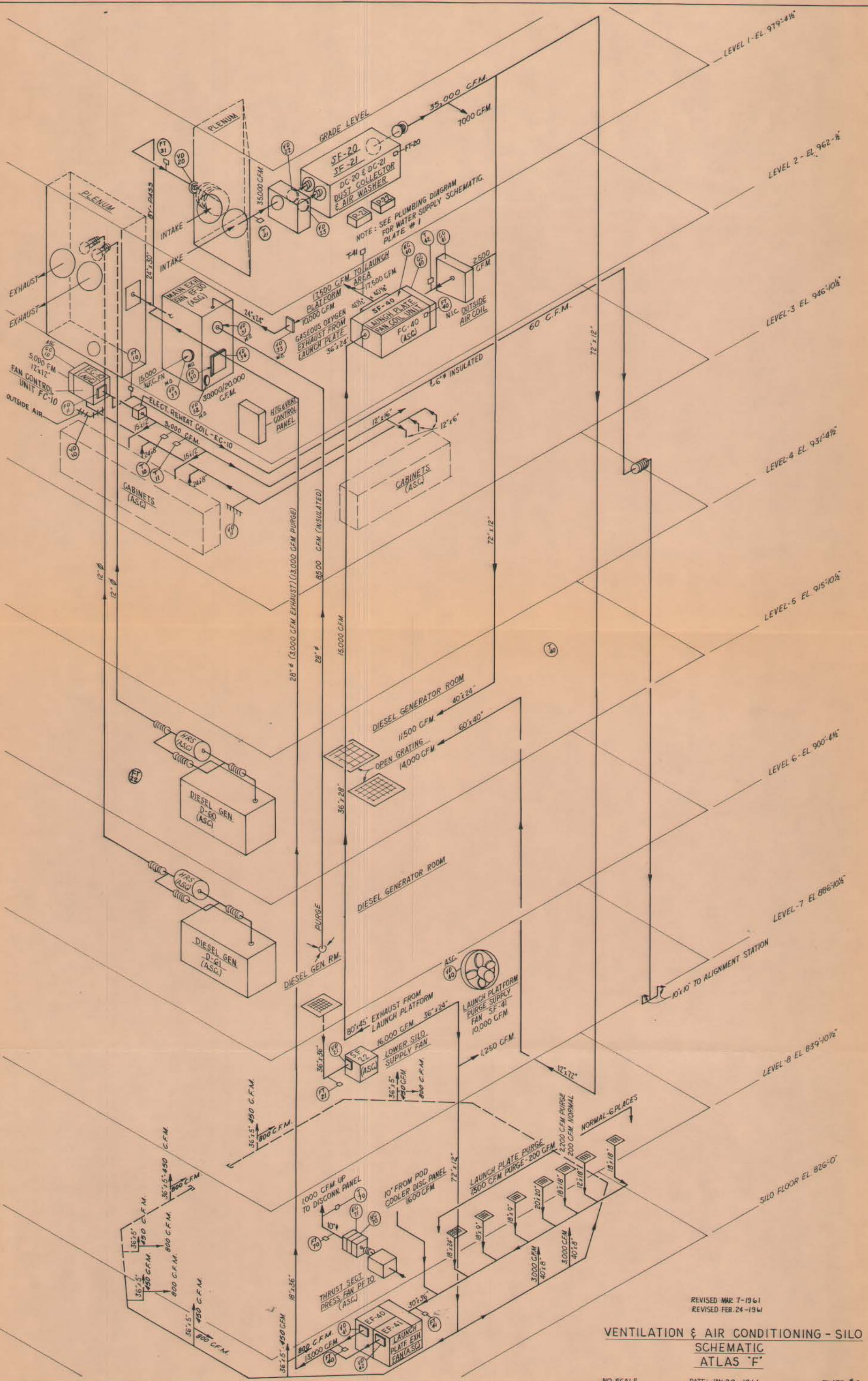




REVISED MAR. 7-1961

SILO PLUMBING (UTILITY) SCHEMATIC ATLAS-"F"

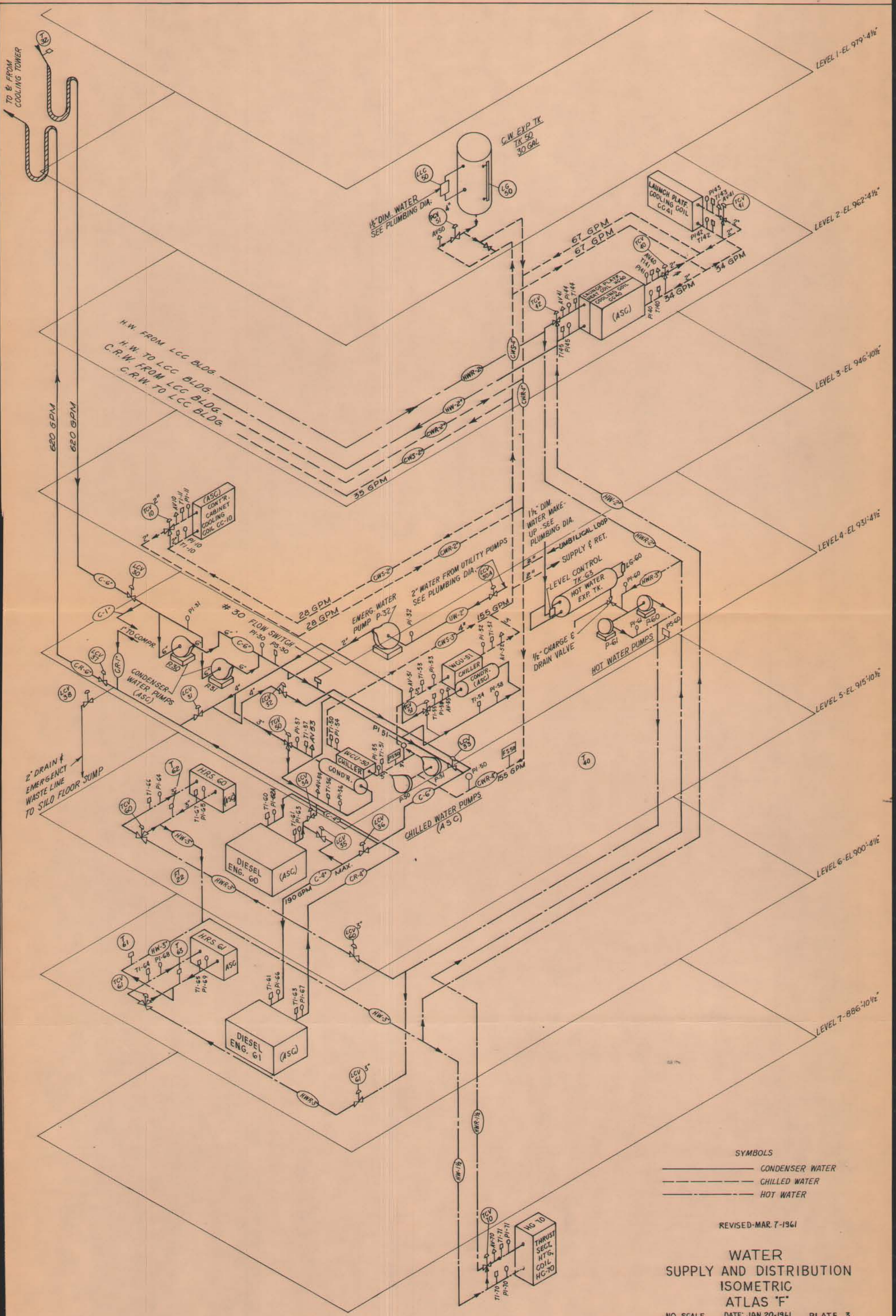
NO SCALE DATE: JAN. 20-1961 PLATE # 1



REVISED MAR. 7-1961
REVISED FEB. 24-1961

VENTILATION & AIR CONDITIONING - SILO SCHEMATIC ATLAS "F"

NO SCALE DATE: JAN. 20 - 1961 PLATE # 2



SYMBOLS

- CONDENSER WATER
- CHILLED WATER
- HOT WATER

REVISED-MAR. 7-1961

WATER SUPPLY AND DISTRIBUTION ISOMETRIC ATLAS "F"

NO SCALE DATE: JAN. 20-1961 PLATE 3

FROM SOFT STORAGE F.O. TK.

CLEAN OIL FILL TOP OF SILO

DIRTY LUBE OIL DISCH. CONN.

LEVEL 1-EL. 979'-4½"

LEVEL 2-EL. 962'-4½"

LEVEL 3-EL. 946'-10½"

LEVEL 4-EL 931'-4½"

LEVEL 5-EL 915'-10½"

LEVEL 6-EL 900'-4½"

LEVEL 7-EL 886'-10½"

BLAST CLOSURE MECHANISMS (ASC)

INTAKE #1

INTAKE #2

EXH #1

EXH #2

TO LAUNCH CONTROL CENTER

FUEL OIL

CLEAN LUBE OIL

HYDROPNEUMATIC TK. 80

FUEL OIL STORAGE DAY TK. 60 665 GAL.

CLEAN L.O. STORAGE TK. 61 348 GAL.

DIRTY L.O. STORAGE TK. 62 348 GAL

DIESEL GEN. D 60 (ASC)

DIESEL GEN. D 61 (ASC) DRU-20

AIR REGEIVER TK. 64

DIRTY L.O. PUMP P-62 (ASC)

INSTR. AIR PREFAB.

SYMBOLS

FUEL OIL

LUBE OIL

AIR

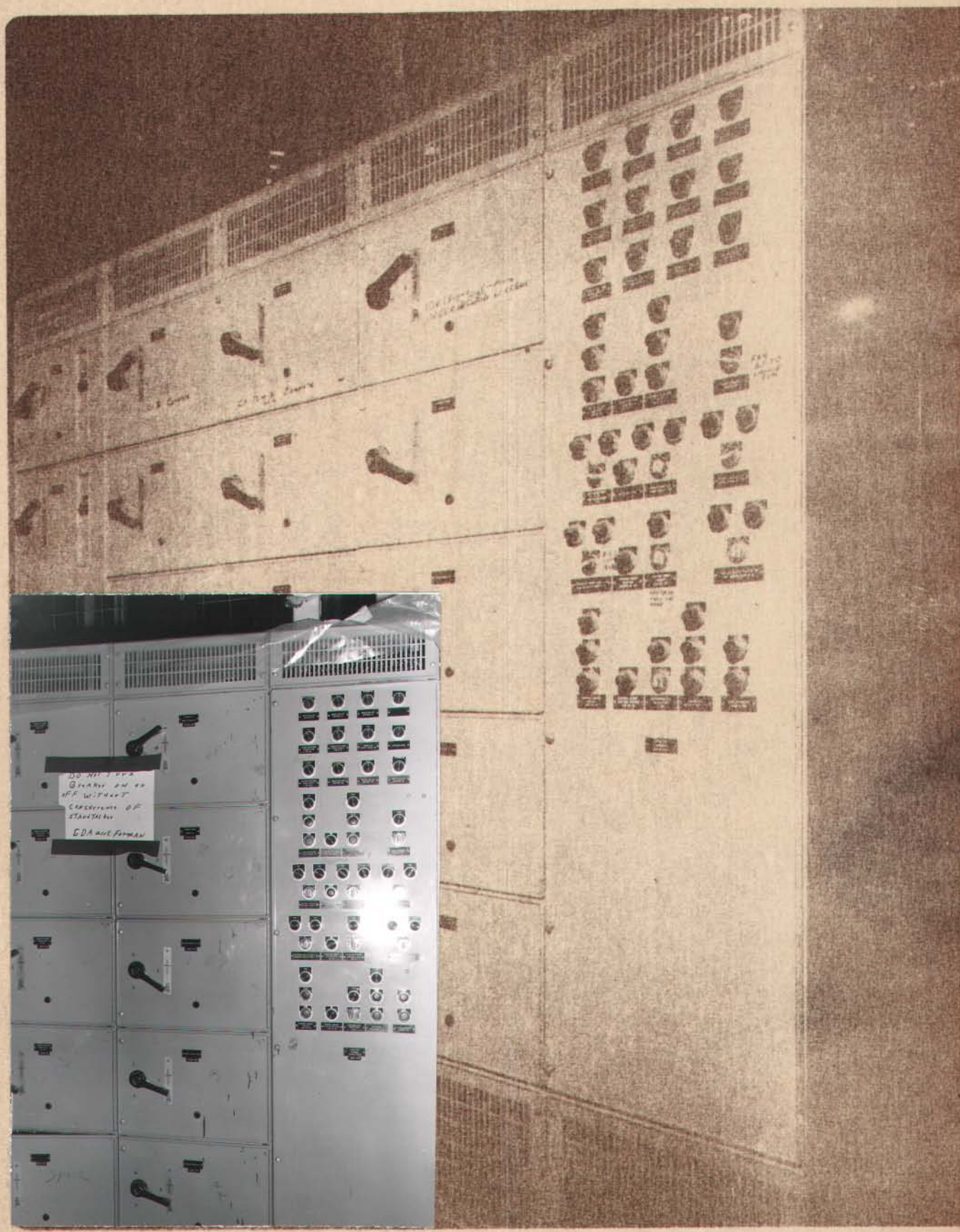
REVISED MAR. 7-1961

FUEL OIL - LUBE OIL & AIR ISOMETRIC ATLAS "F"

NO SCALE

DATE: JAN. 20-1961

PLATE #4



Non-essential Motor Control Center - Front View

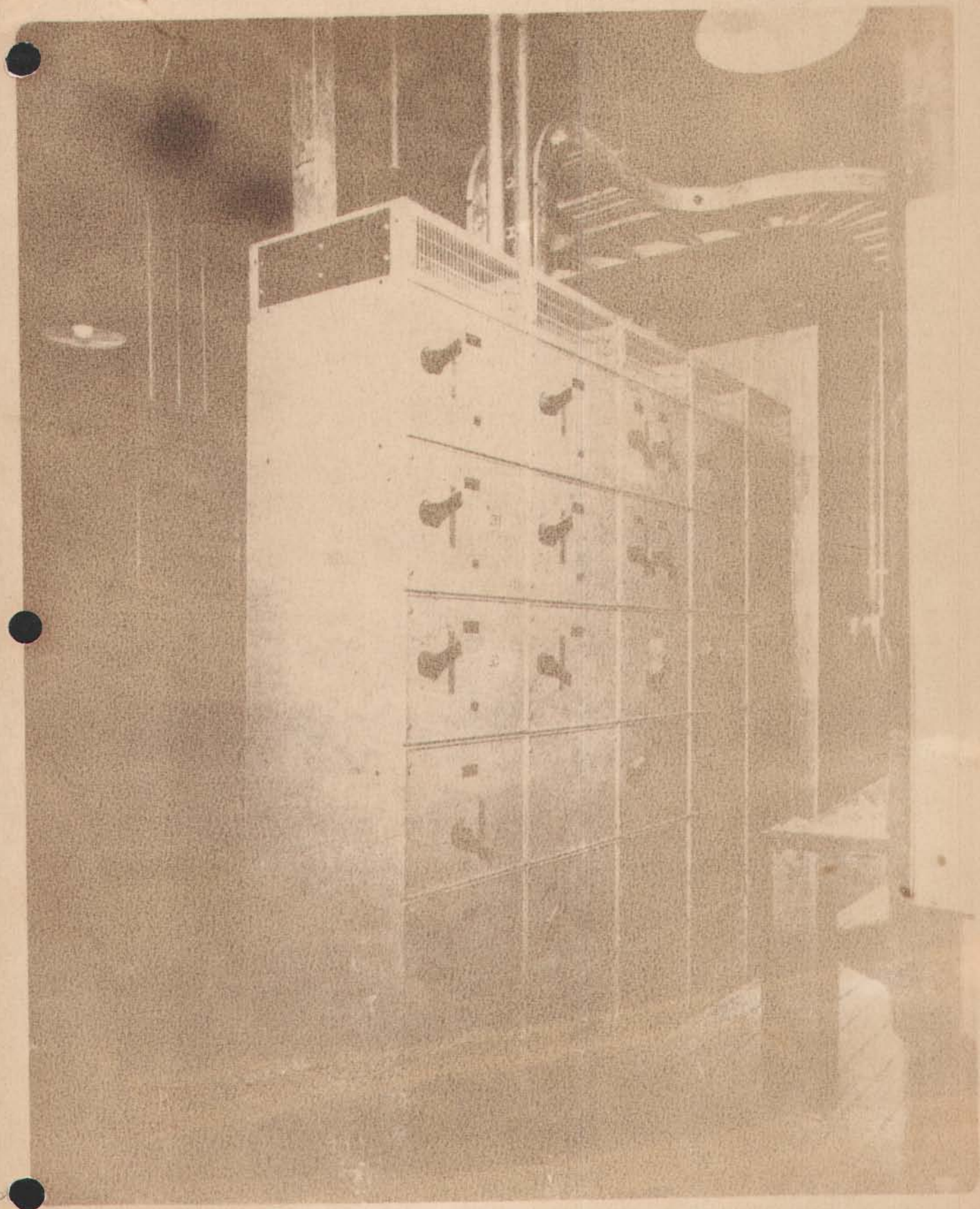
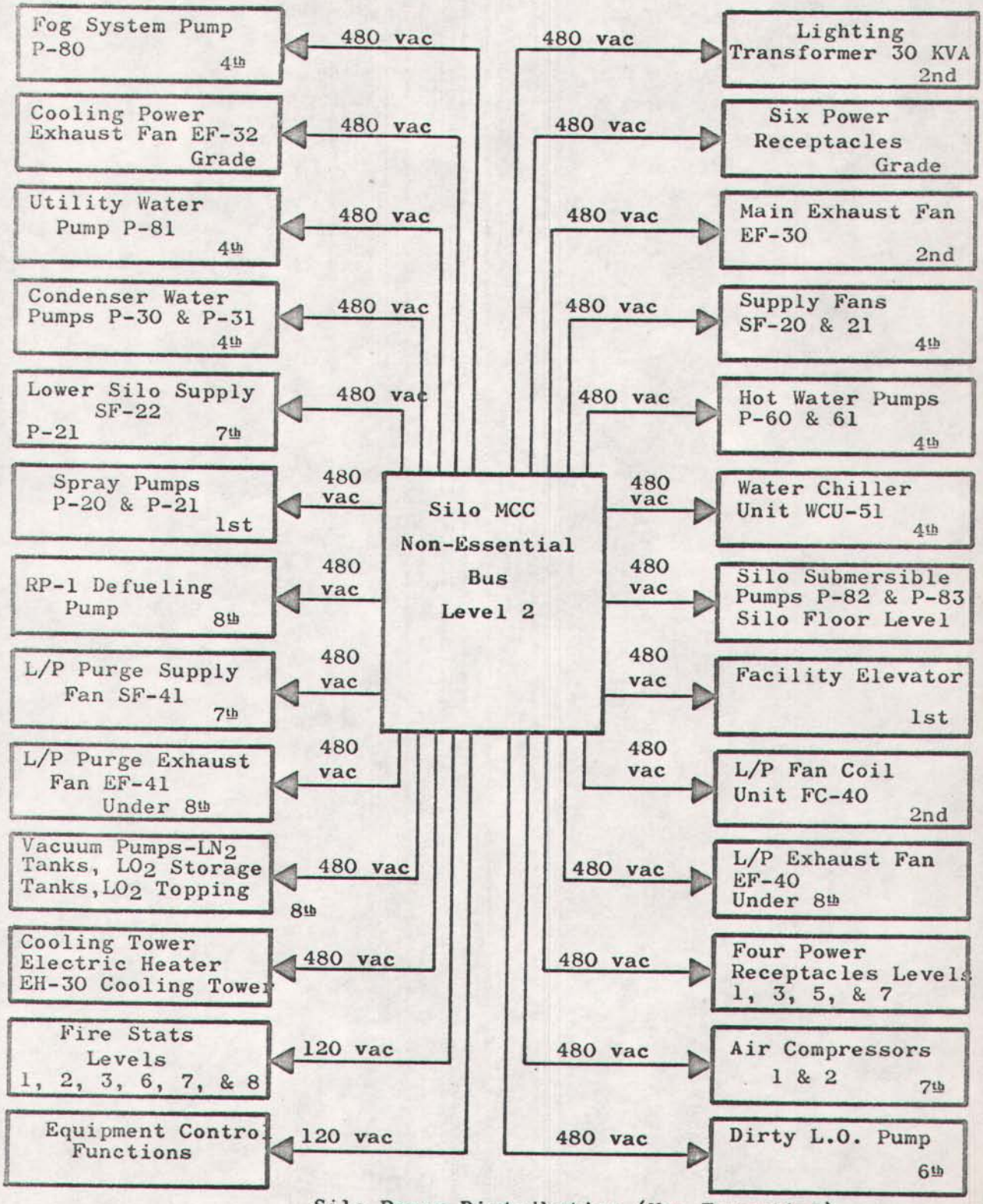
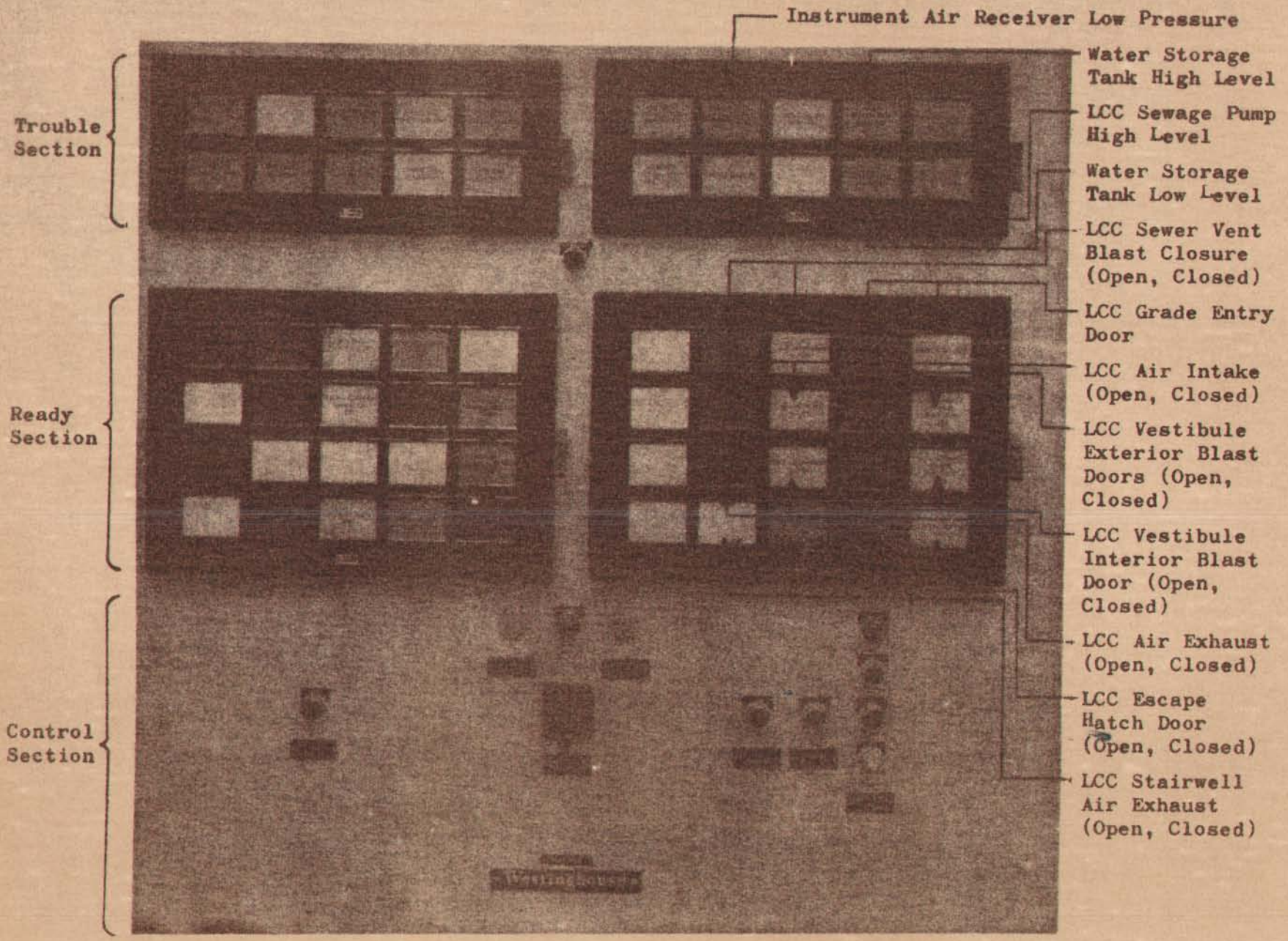


Figure 2 Non-essential Motor Control Center - Rear View

19 May 1961



Silo Power Distribution (Non-Essential)



FRCP - Front View

2 June 1961

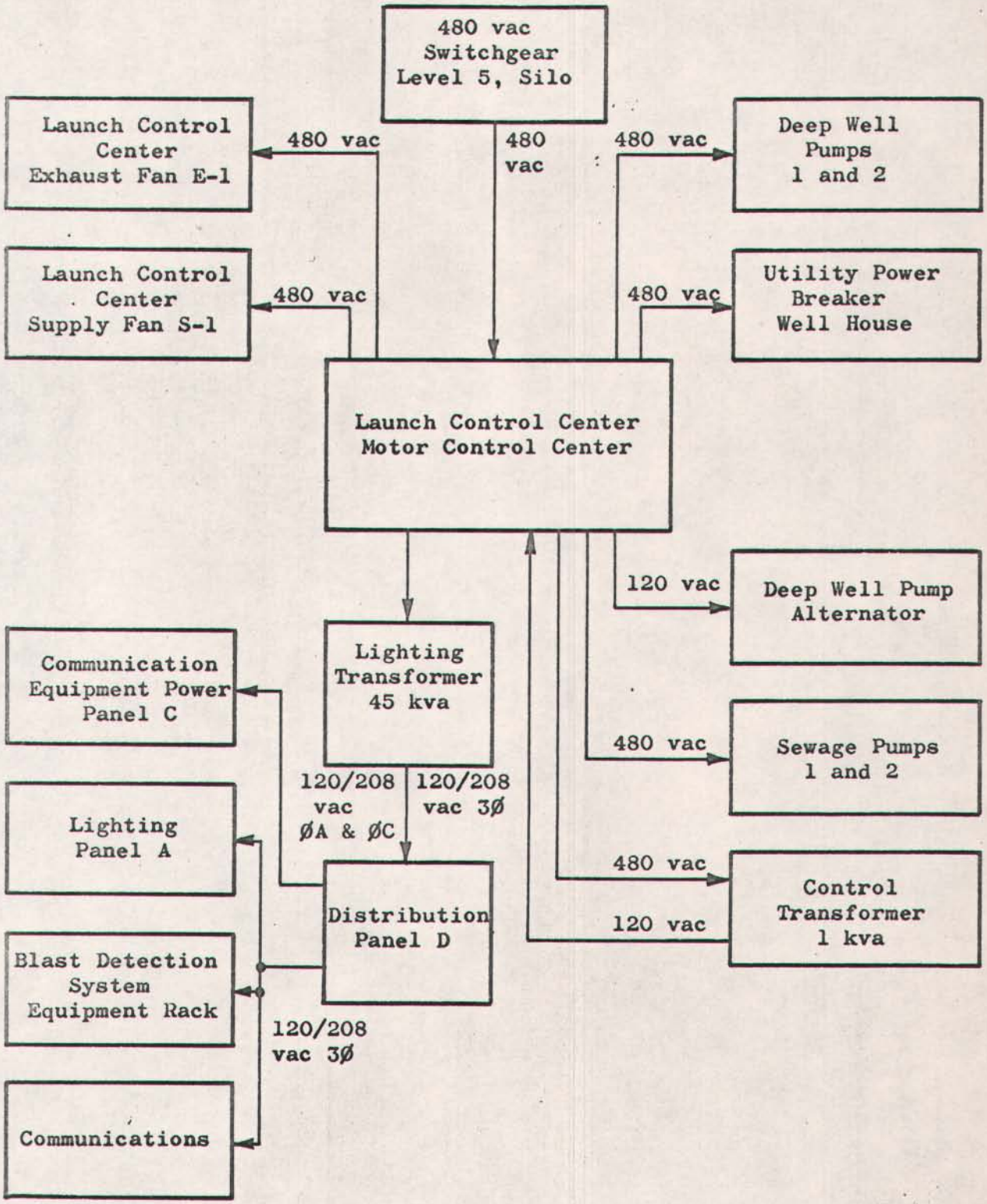


Figure 6 Launch Control Center Power Distribution

DESCRIPTION OF MISSILE LAUNCH COMPLEX

SECTION 1

General

SECTION 2

Electrical System

1. Lighting, Communications and Detection Device
2. Power Diagram
3. Essential Motor Control Center Distribution Diagram
4. Non-Essential Motor Control Center Distribution Diagram
5. View of Facility Remote Control Panel (FRCP)

SECTION 3

Mechanical Systems

1. Silo Plumbing (Utility)
2. Ventilation, Heating and Air Conditioning System
3. Water Supply and Distribution System
4. Fuel Oil, Lube Oil and Air Systems

SECTION 4

Facility Interface Cabinet and its Relation to Other Facilities

SECTION 5

Propellant Loading System Flow Diagrams

SECTION 6

Blast Detection System Equipment

CORPS OF ENGINEERS

BALLISTIC MISSILE CONSTRUCTION OFFICE

LINCOLN AREA OFFICE

BOOK 3

ANNEXES

AREA ENGINEER, LINCOLN
U. S. ARMY, CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
P. O. BOX 953
LINCOLN, NEBRASKA

31 March 1962

HISTORICAL SUMMARY REPORT OF MAJOR ICBM CONSTRUCTION

12 ATLAS "F" ICBM COMPLEXES

and

SUPPORT FACILITIES

LESTER J. HENDERSON
Lt. Colonel, Corps of Engineers
Area Engineer

FOR OFFICIAL USE ONLY

AREA ENGINEER, LINCOLN
U. S. ARMY, CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
P. O. BOX 953
LINCOLN, NEBRASKA

31 March 1962

HISTORICAL SUMMARY REPORT OF MAJOR ICBM CONSTRUCTION

12 ATLAS "F" ICBM COMPLEXES

and

SUPPORT FACILITIES

LESTER J. HENDERSON
Lt. Colonel, Corps of Engineers
Area Engineer

INDEX TO ANNEXES

A. General Description of Missile Complex and Facilities.

B. Prebid Conference

C. Preconstruction Conference

D. Climatological Maps

E. Resume and Results of Final Negotiations on Western Contracting Corporation Contract DA-6186.

F. Record of Final Negotiations with Paul Hardeman, Inc., and Western Contracting Corporation on Propellent Loading System Contract DA-5761.

G. Symposium on Backfill Problems.

H. Breakdown of Construction Work.

I. CCE Soils Team Report.

J. Meeting on Contractor's Claim for Design Deficiencies and Results.

K. Findings of Contract Administration Procedures Review Team.

L. Analysis of Missile Base Construction Costs - Lincoln and other Atlas "F" Areas.

M. Summary of Costs on Basic Contract, Modification, Claims and Associated Contracts.

N. Authority of Contracting Officers Representative.

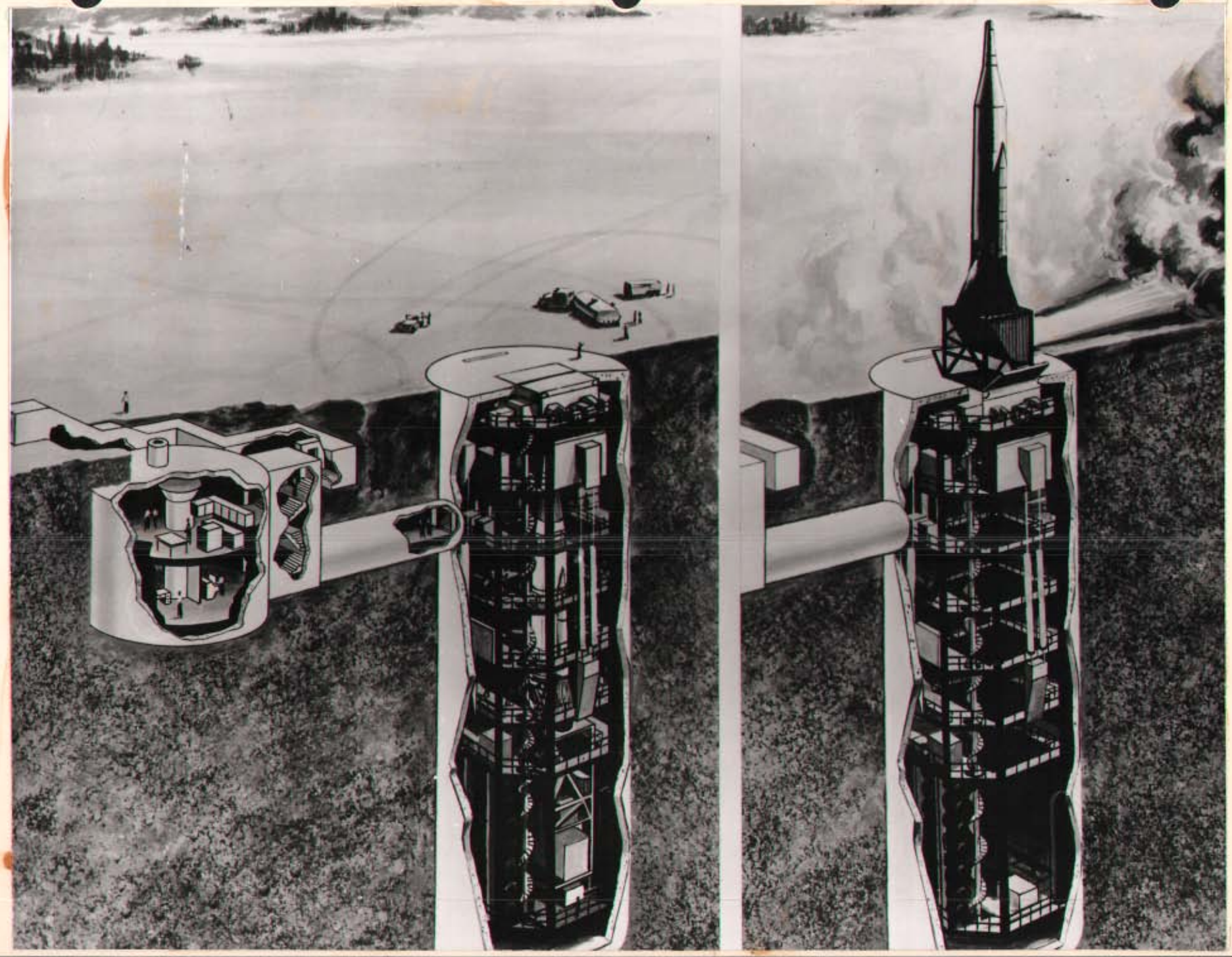
O. Congressional Hearings of Sheppard Committee on the Air Force ICBM Construction Program.

P. List of Firms and Agencies Receiving Plans and Specifications.

Q. Policy on Surveillance by Integrating Contractor Pre-BOD Facility Construction.

R. Results of Tests on Grounding Systems.

S. Series of Prints showing Rate and Distribution of Concrete Placement and Deflections on the Forms for Silo Cap.



DESCRIPTION MISSILE LAUNCH COMPLEX

General

The Missile Launch Complex (original referred to as "sites" during construction) has two major structures. They are the Launching Silo (to house the missile) and the Launch Control Center (which will house the Air Force Firing Crews). A typical site during construction is shown on the next page. In addition, each complex also has a water supply system consisting of water treatment plant and wells (except for Complex 3 which secures water from the City of Tecumseh system).

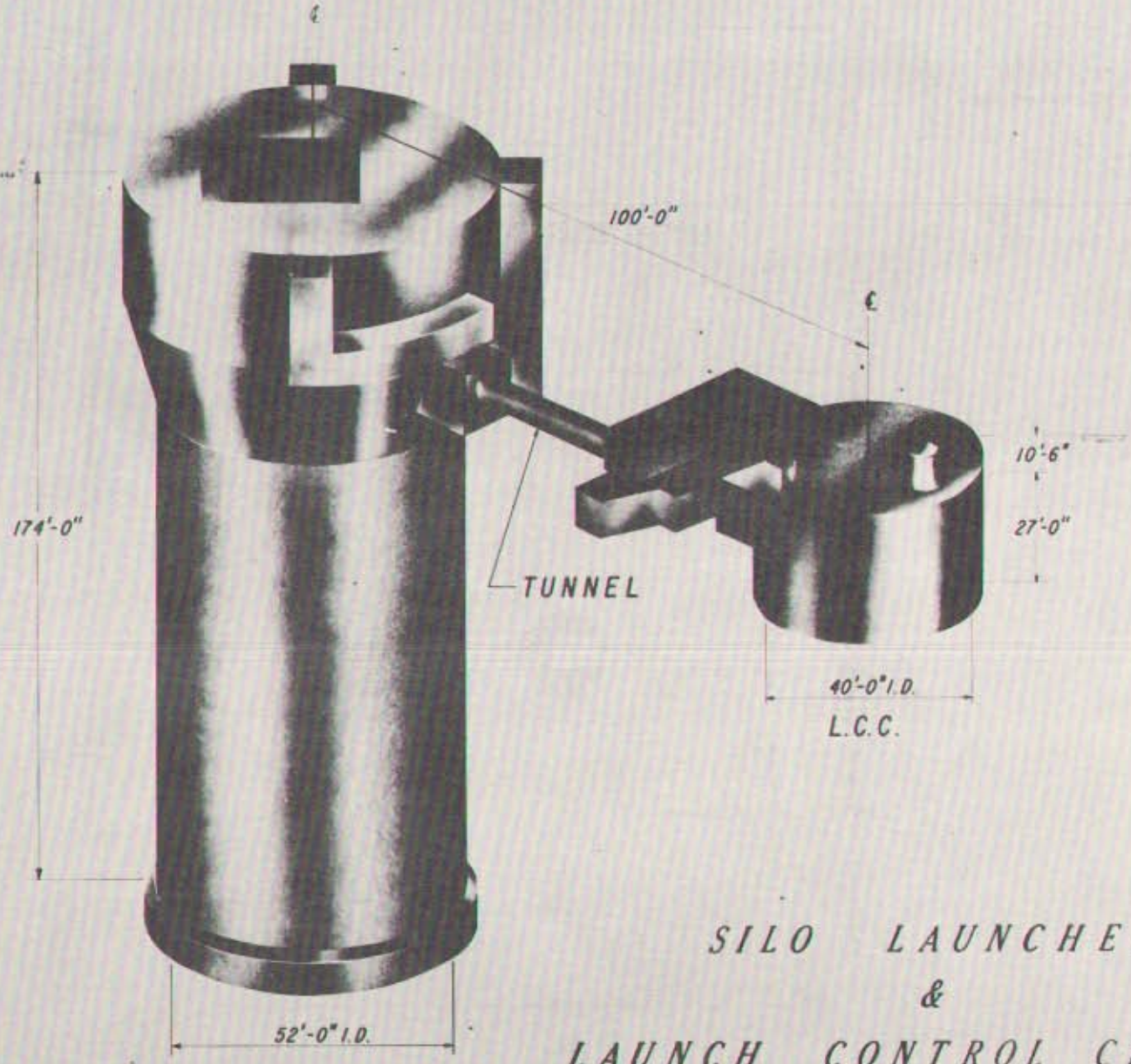
Launching Silo

The Launching Silo is a reinforced concrete cylinder with its top flush with the ground surface. It is 52 feet inside diameter and is 174 feet from ground surface to top of base slab. Doors at the top open to allow raising and firing the missile.

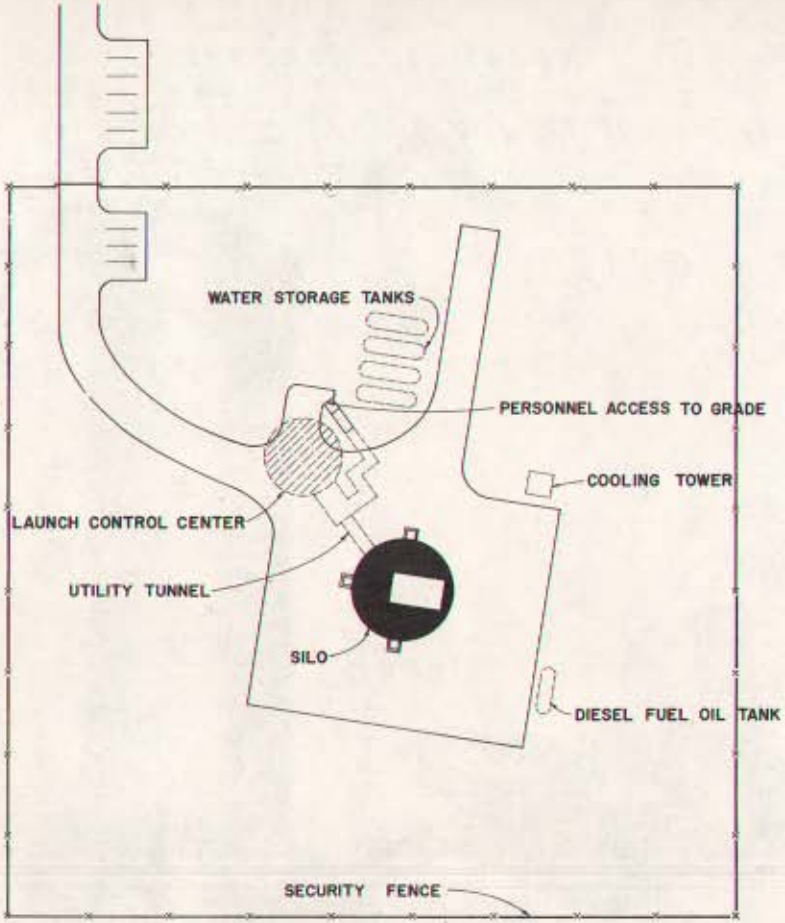
A structural steel framework (or crib) supports the missile and certain items of equipment directly associated with the missile. The entire crib is suspended within the silo shell by four sets of coil springs. This is all part of the construction phase which was done by the prime contractor under the direct supervision of the Corps of Engineers.

Launch Control Center

The Launch Control Center (LCC) is also a reinforced concrete cylinder, with its top approximately 6½ feet below ground surface. It is 40 feet inside diameter and is 27 feet from ceiling to floor. It is connected to



SILO LAUNCHER & LAUNCH CONTROL CENTER



OPERATIONAL SITE PLAN

FOR OFFICIAL USE ONLY

the silo with a tunnel and to the ground surface with an entrance stairway and vertical shaft. The floors of the LCC are of a structural steel framework design (similar to the crib in the silo) and are suspended from four shock hangers or air cylinder spring supports. The hangers are connected to an "eye" which is embedded within the roof of the LCC. This was also part of the construction phase being accomplished by the prime contractor.

Construction Phase

The construction phase consists of the following:

1. The Civil Work: excavating the hole, construction and installing the concrete forms, placing the concrete, installation of the reinforcing steel, backfilling and compacting, etc.

2. The Structural Work: installing and erection of the structural steel frame (crib) and miscellaneous other steel members.

3. The Electrical Work: installation hookup and testing of diesel generators, switch gear and control panel, interface cabinets, cable trays, wireways, conduits, junction boxes, etc.

4. The Mechanical Work: hookup and testing of the heating, ventilating and air conditioning systems, the sewage and drainage systems, the air systems, piping, storage tanks, etc.

5. The Propellant Loading System (PLS): installation of the pressure vessels, cryogenic vessels, skids and control units required to fuel the missile, etc.

Construction Operations

The sequence of operations at all of the sites was generally the same, dependent on the availability of labor and equipment and problems that were encountered. Photographs of various phases of overall construction to date are shown in this report. Upon completion of this phase of construction, the facilities were transferred to SATAF for completion to operational status via GD/A.

The silo and LCC area was an open cut, using tractors and scrapers to approximately 35 feet below natural ground. At this level, excavation of the silo shaft and construction of the LCC commence.

Shaft excavation was accomplished by using a tractor equipped with front end loader and a ripper on the rear. In some cases, the limestone and shale were so hard that frequent drilling and blasting was required. Mucking was accomplished with clamshell and 3½ Cu. Yard buckets. The clamshell was usually used to a depth of 50 feet and the muck bucket used for the remaining depth.

As excavation continued, ring beams (H-type) were installed to support the shaft walls. The spacing of ring beams varied from 2'-3" to 4'-0", depending on the type of walls. Wire mesh reinforcement was placed behind the ring beams and the entire surface was covered with 2 inches of pneumatically placed concrete (gunite). The gunite was required to prevent air-slaking of rock and to prevent small rocks from falling into the excavation. In some cases, solid lagging or sheeting was required and gunite was eliminated.

The placement of most of the concrete wall in the silo was by the slip form method.

Upon completion of the silo wall, backfilling operations and erection of crib steel commenced.

The erection of the crib frame work was a fete in itself. The final product being a steel structural framework (crib) in excess of 160 feet high and weighing many tons.

The next step was the installation, hookup, and testing of the electrical and mechanical equipment and systems required before the I & C phase of work began. This phase was very challenging due to the large amount of coordination that is required between the numerous crafts, i.e., electricians, plumbers, carpenters, welders, painters, equipment operators, tile layers, etc. To make the situation more difficult, space was at a premium within the silo thereby multiplying the coordination effort as well as the patience of the craftsmen and laborers.

The precise technical requirements for construction of the propellant loading system, which represents the key to the operational capability of the complete launcher facility provides another challenge to the contractor. Its component parts, such as pressure vessels, cryogenic vessels, valves, piping, expansion joints, and filters, must be manufactured to permit successful operation without malfunctions, even though subjected to variations in temperatures varying from -297° F. to +120° F. All portions of the system and its component parts must be absolutely cleansed of all foreign particles larger than 150 microns.

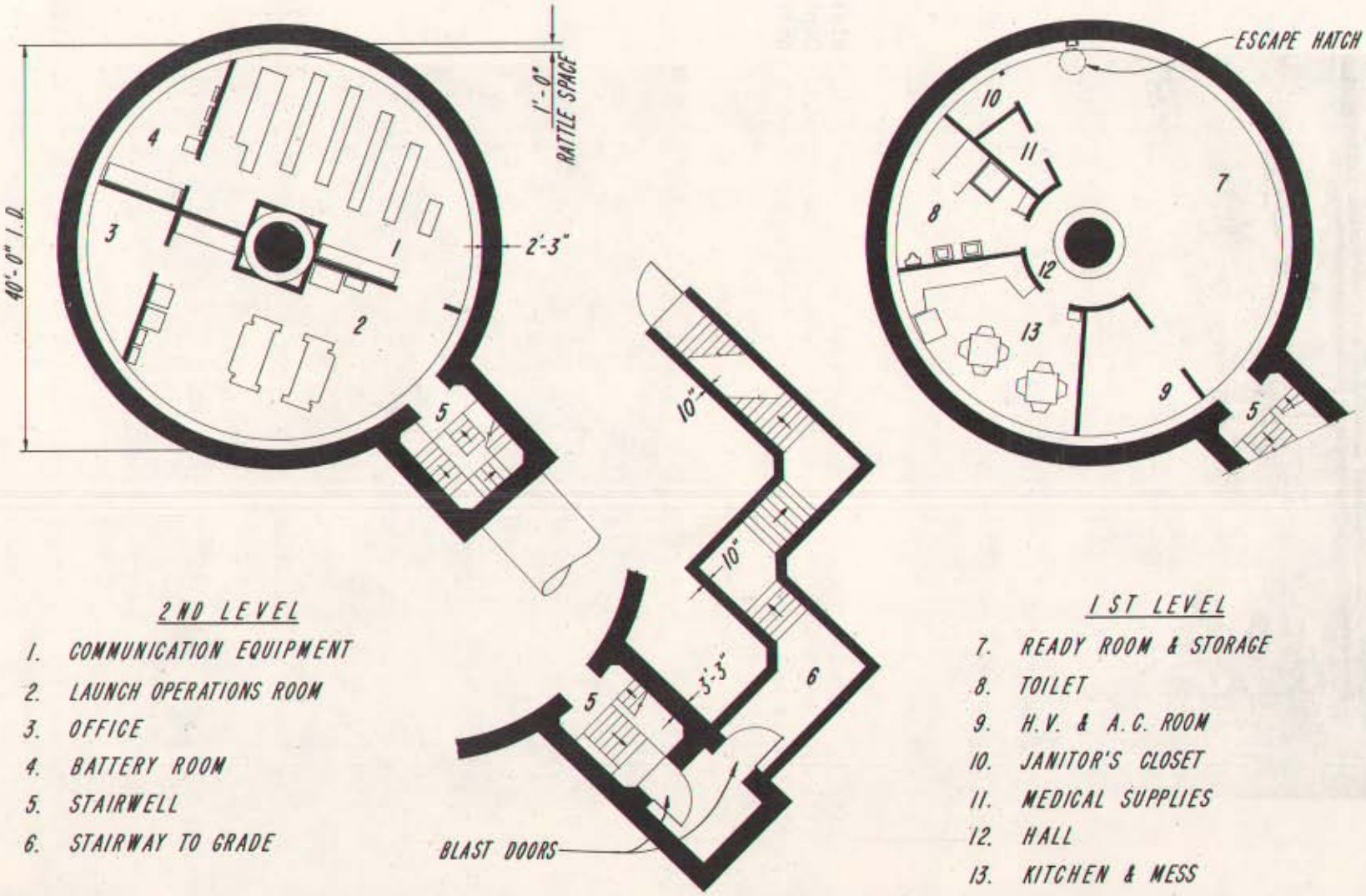
Hydrocarbons in the liquid oxygen system will result in violent explosions in launching systems and void the function of the facility.

It is understandable the problems that are encountered by the contractor in meeting the cleanliness requirements of the PLS system while still allowing the rest of his craft to operate. Especially since these people in this small area will produce or shake up dust and dirt, produce oxides from welding, and other particles.

Construction of the LCC was conducted concurrently with the silo excavation. Concrete for the LCC was placed in four sections (or pours): Floor, center column, wall, and roof slab. Construction of the silo tunnel was accomplished after completion of the silo and prior to backfilling operations.

Photographs in the various parts and sections of this report will give one a pretty good idea of the construction involved and equipment installed.

LAUNCH CONTROL CENTER — OPERATIONAL SITE

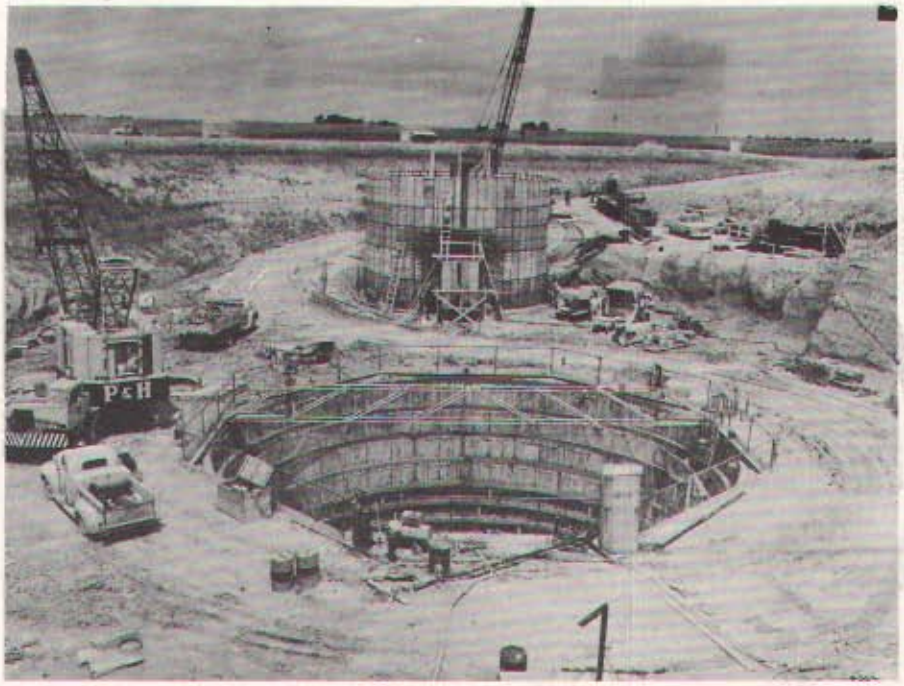


2ND LEVEL

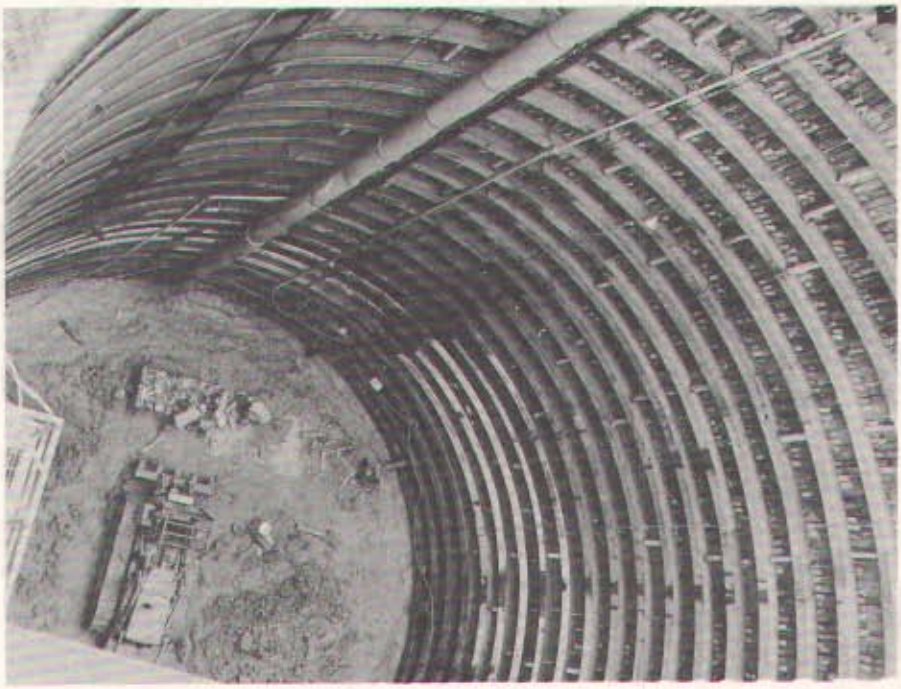
1. COMMUNICATION EQUIPMENT
2. LAUNCH OPERATIONS ROOM
3. OFFICE
4. BATTERY ROOM
5. STAIRWELL
6. STAIRWAY TO GRADE

1ST LEVEL

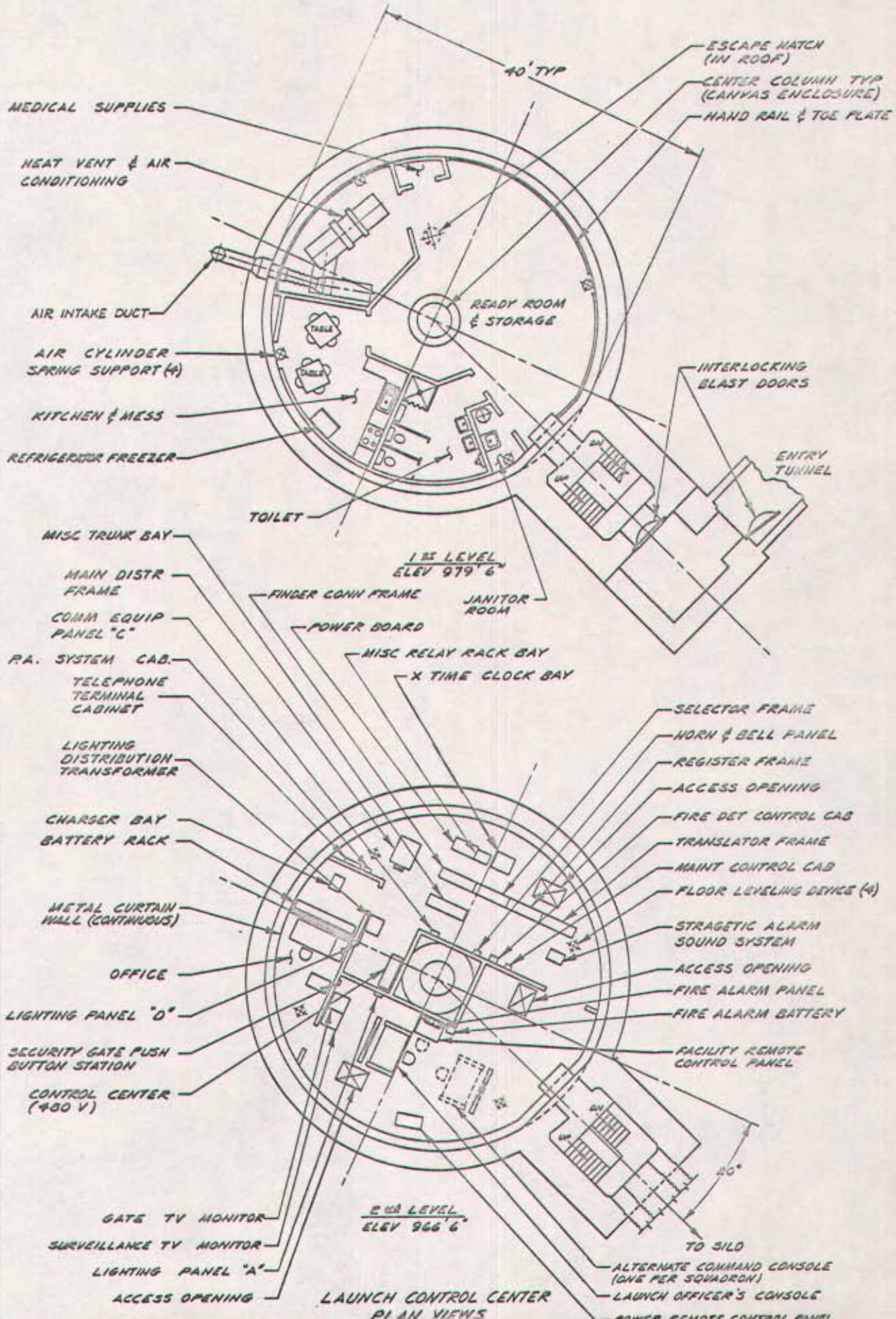
7. READY ROOM & STORAGE
8. TOILET
9. H.V. & A.C. ROOM
10. JANITOR'S CLOSET
11. MEDICAL SUPPLIES
12. HALL
13. KITCHEN & MESS



Site 1. General view looking northwest showing open cut. Missile silo in foreground. Launch control center in background. Depth of silo excavation to 85 feet. Inside forming for launch control center walls within 3 feet of roof line.



Site 1. Interior view of missile silo. Depth of silo excavation is 85 feet.



LAUNCH CONTROL CENTER
PLAN VIEWS

LAUNCH CONTROL SYSTEM "F" SERIES

19 May 1961

120V 60~ 3Ø

400~ MOTOR GENERATOR SET

UMBILICAL EJECTION CONTROL

115V 60 ~ 3Ø

120V 60 CPS 3Ø - SPGG, BATTERY, & ENGINE HEATERS

LAUNCHER CONTROL POWER SUPPLY PANEL

ESSENTIAL MOTOR CONTROL CENTER

DC POWER DISTRIBUTION UNIT

AC POWER DISTRIBUTION UNIT

HYDRAULIC PUMPING UNIT

RE-ENTRY VEHICLE PRELAUNCH MONITOR

AIG COUNTDOWN GROUP

JB

ALIGNMENT GROUP

APCHE MISSILE POWER CONTROL UNIT

CHECKOUT CABLE JUNCTION BOX

JB

AMF

POD A/C

HPU

EMERGENCY BATTERY

GSE MONITOR & CONTROL

LAUNCH SIGNAL RESPONDER NO.2

INDICATOR DISPLAY & COUNTDOWN CONTROL

LOGIC UNIT NO. 2

USED IN RESPONDER MODE ONLY (2)

UMBILICAL JUNCTION BOX

MISSILE POWER FOR APCHE CHECKOUT

MONITOR & CONTROL - MISSILE POWER & AUTOPILOT SYSTEMS - AIG POWER - INITIATORS & SQUIBS

MONITOR & CONTROL - LEVEL & PRESSURE TRANSDUCERS, - FILL & DRAIN, BOILOFF, HELIUM SHUTOFF VALVES, PU RESET

USED IN RESPONDER MODE ONLY (1)

GUIDANCE SIGNAL

GUIDANCE & CONTROL

AUTOPILOT

MISSILE POWER & P.U.

P.U. & PROPULSION

PROPULSION BOOSTER

LAUNCH CONTROL CONSOLE

INDICATOR DISPLAY & COUNT-DOWN CONTROL

SYSTEM INTERFACE SIGNALS

28V DC

115V 400CPS 3Ø

GSE MONITOR & CONTROL

LOGIC UNIT NO. 1

LAUNCH SIGNAL RESPONDER NO.1

VALVE CONTROL

VALVE CONTROL

VALVE CONTROL - PRESSURE MONITOR

FOR RESPONDER MODE OPERATION DISCONNECT 600 SERIES LOGIC UNIT △ PLUGS AND INSERT IN CORRESPONDING 609 SERIES LSR ○ JACKS

MANUAL VALVE CONTROL BOX (USED IN CHECKOUT)

POD AIR CONDITIONING UNIT

NON-ESSENTIAL POWER CONTROL

FUEL DETANKING

DAMPERS & CLOSURES

MISSILE LIFT CONTROL

FACILITY INTERFACE CABINET

PNEUMATIC DISTRIBUTION UNIT

HELIUM CHARGE UNIT

PRESSURIZATION CONTROL UNIT

THRUST SECTION HEATER

JB

AMF LOGIC UNITS

VALVE CONTROL

VALVE CONTROL

VALVE CONTROL

480 VOLT SWITCHGEAR

NON-ESSENTIAL MOTOR CONTROL CENTER

FACILITY REMOTE CONTROL PANEL

FUEL PREFAB

TOPPING CONTROL UNIT

LO_2 PREFAB

LN_2-HELIUM PREFAB

BLAST DETECTION SYSTEM

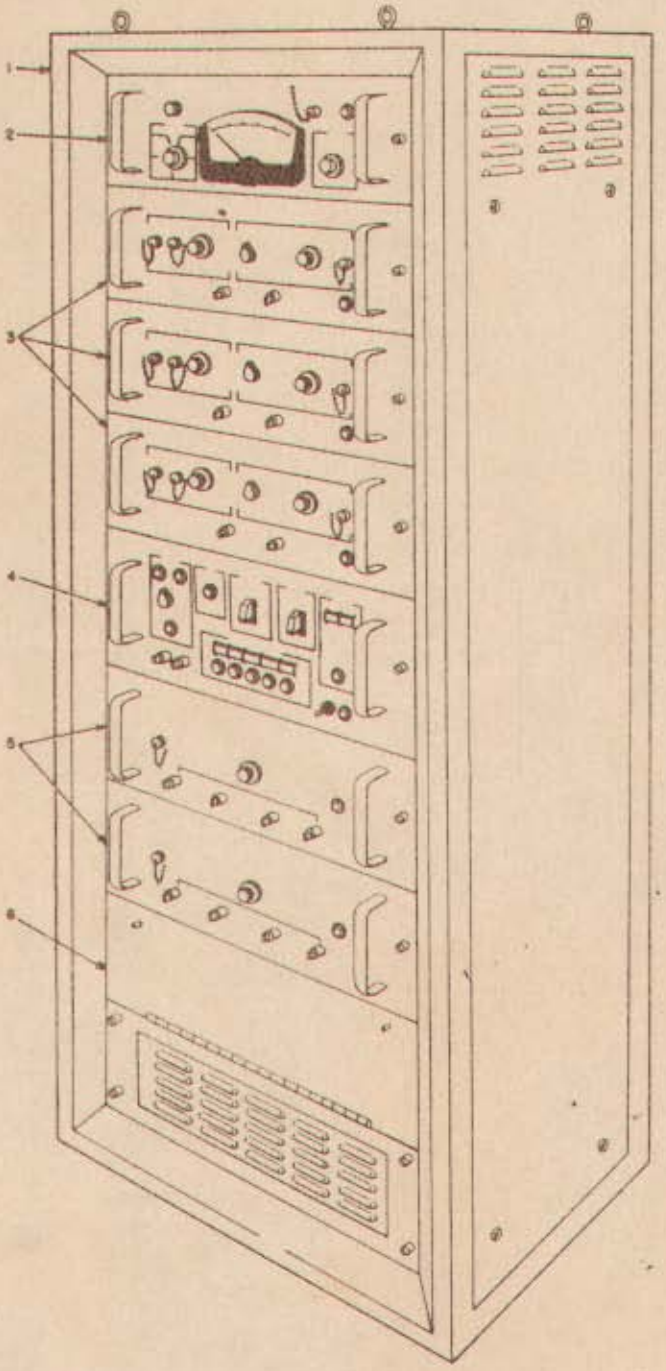
The Blast Detection System (BDS) is an automatic warning and control system. The system is sensitive to the presence of a nuclear blast and will detect a detonation with a pre-determined proximity. When a nuclear blast is detected, the BDS Equipment provides integral relay operation which in turn controls warning signals and the closure of blast closures in the LCC and Silo.

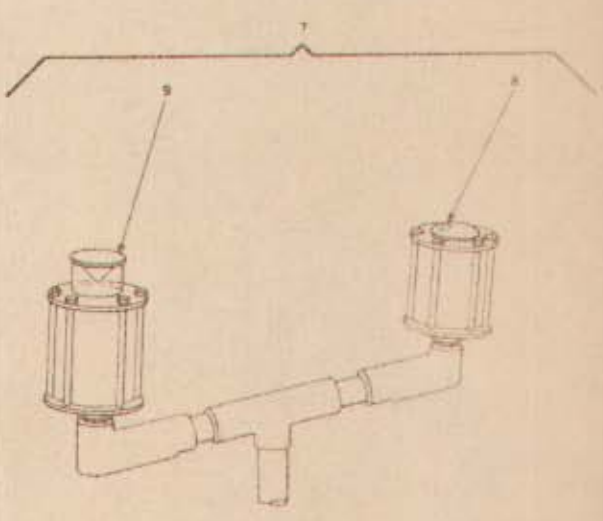
The BDS Equipment has two detection modes; a VLF (Very Low Frequency) radio mode and an Optical mode. Radio detection is by means of a loop antenna buried 10 feet underground and optical detection is by means of a sensitive photo-electric cell mounted on a mast approximately 12 feet above ground level. Three channels of electromagnetic (radio) detection are provided along with two channels of optical detection. Automatic and/or manual self-checking facilities are provided for each channel.

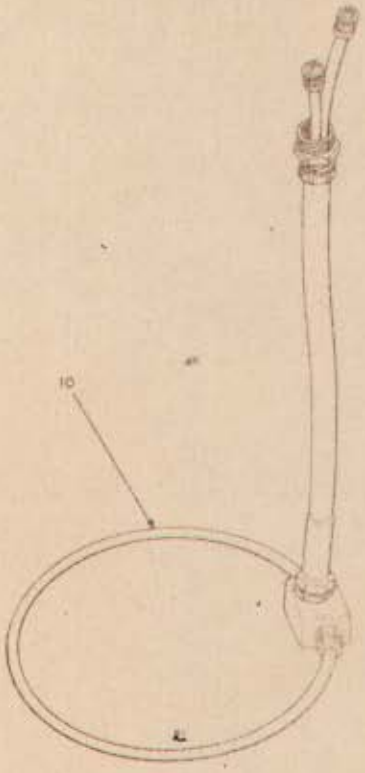
The illustrations on the following page displays the three basic components or assemblies of the Blast Detection System. Items 1 through 6 comprise the BDS Electrical Equipment Cabinet.

The installation of the system was delayed because of freezing weather and broken conduits at the point of outlet of the LCCs.

Site 4, Cortland. BDS Console in position to be hooked up is protected from dust and moisture by Polyethylene cover.







Blast Detection System Components

Attendance
Prebid Conference
Omaha, Nebraska

	Name	Firm Represented	Firm Address
1.	Harry L. Callahan	Black & Veatch	1500 W. Gregory Blvd. Kansas City, Mo.
2.	John H. Downing, Maj	AFBMD	AFUnit PO, LA 45, Calif.
3.	James L. Ennenga	Omaha Dist, CE	1709 Jackson St., Omaha
4.	C. M. Waterman	The Stanley-Carter Co.	125 S. Erie St., Toledo, Ohio
5.	J. B. Wollison	Commercial Shearing & Stamping Co.	Logan Avenue, Youngstown, Ohio
6.	C. F. Corns	Omaha Dist, CE	1709 Jackson St., Omaha
7.	D. S. Denny	Ft Worth Dist, CE	Ft Worth, Texas
8.	H. C. Preul	Omaha Dist, CE	1709 Jackson St., Omaha
9.	L. W. Weaver	" " "	" " " "
10.	Kenneth Kay	Morrison-Knudsen	411 W. 5th, L.A., Calif.
11.	C. W. Milks	Ash Grove Cement	1330 1st Nat'l Bank Bldg Omaha, Nebr.
12.	F. W. Nordeen	S. J. Groves & Sons	500 Wesley Temple, Minneapolis, Minn
13.	W. R. Howard	" " "	" " "
14.	R. E. Kremer	" " "	P.O. Box 145, Eastwood Sta Syracuse, New York
15.	P. L. Sprenger	" " "	Box 125A, Rt, Zanesville, Ohio
16.	A. H. Simmons	Ash Grove Cement	1330 1st Nat'l Bk Bldg. Omaha, Nebr.
17.	R. S. Hudec	Anchor Fence	101 - 5th Ave., Moline, Ill.
18.	C. J. Lenander, Jr.	Omaha Area, CE	Missouri Valley, Ia.
19.	E. D. Clement	Roberts Constr.	1018 Trust Bldg., Lincoln, Nebr.
20.	V. L. Hastings, Col.	USAF	Wahoo, Nebr.
21.	A. S. Dare	"	" "
22.	Bill Jennings	Lone Star Cement	3108 So. 40th, Lincoln, Nebr.
23.	W. V. North	Omaha Dist, CE	1709 Jackson St., Omaha
24.	G. D. Haugse	" " "	" " " "
25.	Agatha Foll	" " "	" " " "
26.	Karen Poore	" " "	" " " "
27.	T. A. Baughman	Lyman-Richey	750 Omaha Nat'l Bk Bldg. Omaha, Nebr.
28.	Jack Shields	Omaha Area, CE	Arlington, Nebr.
29.	D. Nessan	" " "	" "
30.	R. H. Barber	Westinghouse	117 No. 13th St., Omaha, Nebr.
31.	Lewis P. Jarvis	Raymond Inter Inc.	140 Cedar St., NYC 6, N.Y.
32.	John W. Perme	Geo. A. Fuller Co.	(3100 W. 8th St., LA 5, Cal. (Governors Inn West O St. Lincoln, Nebr.

	Name	Firm Represented	Firm Address
33.	C. A. Budnik	Kaiser Engrs	Oakland, Calif.
34.	M. B. Clapp	Chicago Bridge & Iron	332 So. Michigan Ave. Chicago 4, Ill.
35.	T. F. Cocks	" " "	7928 Stateline Rd., Kansas City, Mo.
36.	Geo. Foster	Foster Constr Co.	Box 295, Oroville, Calif.
37.	H.L.Schroeder, Lt Col	Omaha Dist, CE	1709 Jackson St.
38.	Col. Haley	" " "	" " "
39.	Maj. Henderson	Lincoln Area	Lincoln, Nebr.
40.	D. H. Hammond, Col	Omaha Dist, CE	1709 Jackson St.
41.	J. O. Ackerman	" " "	" " "
42.	L. P. Langdon	" " "	" " "
43.	P. H. Anderson	" " "	" " "
44.	Marie P. Slaughter	" " "	" " "
45.	Mason F. Travis	Western Contr Corp.	400 Benson Bldg., Sioux City, Iowa
46.	Capt. Nolen Chafin	AFROE-MRR	Farm Credit Bldg., Omaha, Nebr.
47.	Gene A. Minnenmann	" "	" "
48.	J. Bower	Simpkin & Auburn, New Jersey	c/o American Casualty 928 City Natl Bk Bldg Omaha, Nebr.
49.	T. E. Archer	Minneapolis Honneywell	403 N. Saddle Creek Rodd Omaha, Nebr.
50.	H. D. Robertson	Olson Constr Co.	410 So. 7th, Lincoln, Nebr.
51.	D. C. Olson	" " "	410 So. 7th, Lincoln
52.	Curly Groves	Ready Mixed Concrete	1800 Y, Lincoln, Nebr.
53.	Robert Harrigton	Abel Constr.	1815 Y, Lincoln, Nebr.
54.	W. J. Wells, Jr.	Kirkham-Michael & Assoc.	508 So. 19th, Omaha
55.	B. B. Michael	" " "	" " "
56.	Jack Thompson	Watkin & Co.	1400 Furnas, Lincoln
57.	Bert F. Steves	Black & Veatch	114 W. Gregory Blvd., Kansas City, 14, Mo.
58.	R. S. Patterson	" "	" " "
59.	Jack Cramb	Commercial Shearing & Stamping Co.	1775 Logan, Youngstown, Ohio
60.	Bill Hamilton	Flint Steel Corp.	P. O. Box 1289 Tulsa, Okla.
61.	Wm. Cooley	Omaha Dist, CE	1709 Jackson St.
62.	Curtis O. Lehn	" " "	" "
63.	A. A. Mathews	Construction Engr.	117 E. Colorado St. Pasadena, Calif.
64.	H. H. Westphal	S.J.Groves & Sons Co.	500 Wesley Temple, Bldg. Minneapolis, Minn.
65.	J. F. Healey	" " " "	Box 1059, Springfield, Ill
66.	Judd Mowry	" " " "	500 Wesley Temple Bldg. Minneapolis, Minn.
67.	Robert B. Hickok	Hq, AFEMD	AF Unit PO, LA 45, Calif.

	Name	Firm Represented	Firm Address
68.	A. D. Harvey	Black & Veatch	AFEMD Fld Ofc, Wahoo, Nebr.
69.	L. Philip Theriault	Area Engr, CE	Lincoln, Nebr.
70.	N. C. Renner	Kansas City Dist, CE	Kansas City, Missouri
71.	W. B. Parker	Kaiser Engrs	Kaiser Centre, Oakland, Calif.
72.	Russ Mai	Peter Kiewit Sons Co.	1024 Omaha Nat'l Bk Bldg Omaha, Nebr.
73.	Bob Musick	Farwell Co., Inc.	300 So. Buckner, Dallas, Texas
74.	A. J. Nixon	Condon-Cunningham	4229 Lafayette, Omaha
75.	E. W. Robison	Westinghouse	117 No. 13th St, Omaha
76.	G. W. Ballard	Armco Drainage & Metal Product.	1102 WOW Bldg., Omaha
77.	R. E. Hole	LAFO-OCE	AF Unit PO, LA 45, Calif
78.	I. J. Rocklin	Rocklin Mfg. Co.	110 So. Jennings, Sioux City, Iowa.
79.	Ormand F. Meyer	Crane Co.	(836 So. Michigan, Chicago (3617 Hartman, Omaha
80.	Joe Prenk	Gunite Co.	313 So. 51 Ave., Omaha
81.	John C. Raleigh	John W. Stang Corp.	2123 So. 56th St., Omaha
82.	C. R. Kerilo	" " "	" " "
83.	Paul M. Freeman	Bechel Corp.	4620 Seville, Vernon,Cal.
84.	Robert G. Metcalfe	" "	" " "
85.	H. L. Dodge	" "	" " "
86.	W. F. Bott	Kaiser Engrs,	300 Riverside Dr. Oakland, Cal.
87.	C. Kuhn	MRD, CE	Farm Credit Bldg.,Omaha
88.	A. Bauman	Omaha Dist, CE	1709 Jackson St., Omaha
89.	Ray Leonard	" " "	" " " "

Minutes of Conference

First Session - Time 10:00 A.M.

Conference conducted by: D. G. Hammond, Colonel, Corps of Engineers,
District Engineer, Omaha District

Colonel Hammond: I welcome you to our pre-bid conference for the construction of the ATLAS silo-type squadron at Lincoln, Nebraska. Just to be sure that you are all at the right meeting this is Lincoln 107 A-1, Operational Base, Complexes 1 through 9, Lincoln Air Force Base. It is our invitation number Eng-25-066-60-52.

I'm glad to see that we now have such a good set of plans and specifications that you're represented here today in far fewer numbers than we have had at previous pre-bid conferences. Our Architect-Engineers here are smiling, I don't know whether they doubt my statement or whether they really believe it is so.

We do have some questions which have been submitted in advance. Many of you may be familiar with the pattern which we have established for our pre-bid conferences here. Now, before we get into the actual purposes of the meeting I would like to introduce to you some of the people with whom you will be dealing quite closely on this job. First, is Lt. Col. Hal Schroeder, who is going to be the Area Engineer in charge of the prosecution of this job; Major Henderson who will be the Assistant to Col. Schroeder; Phil Theriault, who is the Assistant Area Engineer. Many of you may not have met Colonel Haley, who very recently arrived as the Deputy District Engineer, my Deputy, for our over-all intercontinental ballistic missile program. On the other side of me is Major Downing of the Air Force Ballistic Missile Division, who will appear on the program a little bit later this morning.

This may be "old hat" to some of you but we are going through the same points that we have made in our previous pre-bid conferences. First of all, as to the purposes which we hope the conference will serve. The first, is your opportunity to bring to our attention any ambiguities or any unclear statements that may have crept into the plans and specifications. I have stated that we have already received a number of these in writing and we have our teams of experts busy preparing what we hope will be satisfactory answers to them.

I call to your attention our Standard Form 22, Instructions to Bidders, which I quote "Oral explanations or instructions given before the award of contract will not be binding. Any interpretation made will be in the form of an addendum to the specifications or drawings and will be furnished to all bidders, and its receipt by the bidder shall be acknowledged." I think this is for obvious reasons that we want to be sure there is no misunderstanding through oral discussions of questions and answers. Also, we want to insure that all bidders

whether they are here today or not have the benefit of the same information as others at the time of figuring their bids. So our point is we want you to ask your questions, we will answer them and I am not trying to say to disregard the answers that we give you here but I am saying to check the written word which you get afterwards to make sure that you have a clear understanding of what the answer was and what it intended to say.

A verbatim record will be made of the proceedings here and we will furnish them to all bidders on request. You may make your request either by leaving it at the table here at sometime during the day or by a letter addressed to the District Engineer, Omaha District, asking that you be furnished a copy of the proceedings.

You've heard this next point before and it should go without saying but we certainly don't intend to let it go without saying and that is the all-important urgency of the job offered in this invitation. And the absolute necessity of taking all necessary actions to insure that the dates are met. This ICBM job, like all the others, that we have talked about in the past, is a part of the National Defense Program. The date for the operational capability of this squadron has been established on national defense considerations, tied into the manufacturing schedules for the missile and for associate equipment provided by others. The construction which you are invited to make proposals on is one part and an important part of that but is tied to the over-all program. If there are any slippages or delays in the construction portion of this schedule then they have to be reflected back in the later schedules of equipment installation and check-up. It is not within the province of the Corps of Engineers and to a large extent not within the province of the Air Force Ballistic Missile Division to change the established need dates for all phases of the program.

My next comment again will not be new to you but it ties to this and I urge you to take it into consideration. The schedule on this job starts out very tight. Our experience has been and I am sure it will be on this one that it will get tighter as it goes along. And I want to put you on notice on that, that we recognize that this is not a leisurely time period which is being provided for the construction and there will be undoubtedly many things happen during the course of construction which will make it even tighter than it started out to be. This is by way of putting you on notice that you must take this into account. You must be prepared to take necessary actions to overcome these obstacles which while formidable are not impossible. To be sure that we draw your attention to this we have gone to the extent of including in the Special Conditions some of the measures which we feel essential that you consider in this connection. I won't go into them in detail but I would call your special attention to paragraph SC-29 of the Special Conditions in the specifications.

Our next main purpose in holding these pre-bid conferences is to provide a quorum for discussion of the general policies and procedures which will apply to this particular job, and I have mentioned the most important of them already. In essence we want quality construction built in strict compliance with the contract documents, and to most of you who have worked with the Corps before, there is nothing new about that or nothing special about it in regards to this just because it is a missile program. But we do emphasize it here because while we put great stress on the importance of meeting completion dates, we have no intention of allowing you to meet that day by anything other than quality construction as called for by the specifications. We know that you do not have that intention either but we want to make it quite clear that although these two are opposite considerations, they are not incompatible in our view.

Certainly no Corps of Engineers discussion about a contract would be complete without the mention of Safety. And, here again, while this job is urgent, complex, difficult and all the other adjectives that you want to apply to it, it isn't any different from any other of our jobs as far as our insistence on compliance with the specifications and safety, as you well remember, is one of the important considerations that we take into account in the field prosecution of the job. This being primarily an underground job there are certain special precautions in connection with safety and I would direct your attention to the provisions which cover some of the special safety features. Again our purpose in doing this is to tell you that we put them there because we meant it and please don't ask us to waive them or to consider that they are pretty stringent and you really don't think that you will go about carrying them out because as I said we put them there because we mean it and we mean them because they are there.

This next point is somewhat special to the ICBM jobs and that is that during the latter stages of the job it is likely that the Air Force contractors will be installing equipment in the facilities which you will be constructing. You will be expected to coordinate your work with that of these other Air Force contractors who will possibly be in the area, or other Corps of Engineers contractors. As usual, the Area Engineer will be the coordinating agency through whom you work in order to avoid delays or conflicts between your work and that of others.

There are some other special points in connection with this particular job, to which I would like to draw your attention. There is a fairly large amount of material which is to be incorporated by you into the work but not procured by you.

The Kansas City District of the Corps, through separate procurement, is providing such things as Facility Elevators, Diesel Engine Generators and Switchgear, Air Cylinder Spring Supports for the Floor Support System in the Launch Control Center, Blast Closures and the Silo Overhead Door Hinge Systems.

The Fort Worth District of the Corps is providing PLS Prefabs and interconnecting piping for the Propellant Loading Systems as well as Heating, Ventilating, Air Conditioning Equipment and Pumps. The contracts for the elevators and the propellant loading system equipment also include the installation of these items. The other items do not include installation and all costs in connection therewith should be provided for in the bids for this construction contract.

It is intended and so stated in the specifications of the procurement contracts as well as the construction contracts that all of them will be assigned to the construction contractor for a continuation of action necessary after the date of assignment.

I will encourage you to take advantage of the provisions of paragraph 13 of Bidding Information which provides that copies of contracts contemplated for assignment to the construction contractor will be available for inspection at the District Office here, that is at 1709 Jackson Street in Omaha, or at the District Engineer's Office in Kansas City, 1800 Federal Office Building; or at the District Engineer's Office at Fort Worth, Texas, at 100 West Vickery Boulevard. I will caution you at this point that these assigned contracts which you may see now will be bidding contracts and not be final executed contracts. Copies of the final assigned contracts will of course go to the successful bidder for this construction contract after the award is made.

I want to emphasize at this point, that it is intended that the supply contracts be assigned to the contractor under this construction contract, and I don't say maybe or we will do it if you are willing, they will be and I don't want to argue about it. And if you think I am being nasty this is based on arguments which I have been having.

The Kansas City and Fort Worth Districts will check the shop drawings and they will supervise tests in the shop or place of manufacture. And this will continue even after the assignment of the contracts to the construction contractor. The construction contractor after assignment, however, will be required to administer all other phases of the contracts, this will include but not necessarily be limited to (to use Standard Governmentese) coordinating and expediting delivery and installation, accepting delivery of all items, assuring proper storage, performing field tests, and making payments to the supply contractor. In short, you will do everything under the assignment of this contract that you would do if you had let it yourself and we had never been involved, with the exception of the approval of shop drawings and the shop inspection supervision which I mentioned previously.

Under similar provisions of the specifications in the supply contracts, supply contractors are required to furnish a competent erection engineer at the time of installation of this equipment. Reimbursement will be made to the construction contractor for all

payments made to the supply contractor, including this cost of the erection engineer. And this reimbursement again will be made through the normal standard provisions of paying the prime contractor on his payment estimates with the prime being responsible for paying the supply contractor as though he were originally his own subcontractor.

There is no separate bid item for administering these contracts. The costs involved in such administration should be included by you somewhere in what you consider the applicable bid item. In other words there will not be a separate bid item for this and it will not be subject of later negotiation as to the fact that you made ten long distance telephone calls when ordinarily three would have done it and that is not just a parenthetical expression because you will probably be involved in just that sort of thing in pushing this supplier. Put it in there for the amount that you think it is going to cost you and put it on the same basis as your other estimates of cost.

Also listed at the end of the Special Conditions are certain items of Government-furnished material such as crio suspension systems and the launch platform equipment. And this now will be Government-furnished equipment and not equipment under a contract originally let by the Government which is assigned to you. They will be handled in the normal manner that Government-furnished material is, only better we hope, and this is set forth in paragraph SC-8 of the Special Conditions, and I would caution you to keep clearly in your mind the distinction between these two types of equipment. These items will be Government-furnished equipment all the way, whereas the other item that I talked about will be procured under contracts that will be assigned to you later but originally awarded by the Government.

This suffices for our general comments. As I mentioned we have a number of questions in writing already. Before inviting you to ask questions from the floor, I would like to give Major Downing an opportunity to say a few words and I believe he has some pictures which he would like to show you that may give you a little better idea of what is involved in the job. And I will call your attention to the model which is located on the table at the rear of the room. It will remain here throughout the day to give you a picture of what goes into the silo.

Major Downing: Gentlemen I am from the Air Force Ballistic Missile Division of Los Angeles, California. I might mention at this time that I am certain that many of you here this morning were also present for viewing of the slides, which I have here, for the Schilling bid opening at Kansas City, so those who have seen them please bear with me on the pictures and to those who are new this morning I am sure you will find them enlightening. May I have the first slide please.

The first slide that we have is, of course as you see, a map of the United States. We're embarking on rather an extensive ATLAS program. You will note by the colored red squares the first of our ATLAS configurations which were known as the coffin type configurations, on the four bases plus the test facilities which are located at Vandenberg, California. You will also note the Schilling Site which is the forerunner on the first silo, the second one of course being Lincoln and the respective follow-ons in the order which I will give you in construction will be Altus in Oklahoma, Dyess, Texas, Plattsburg, New York and Walker in New Mexico in that order of construction. All of the black dots circled are the silo-type configuration with which we are working here today. These locations were publicly released by the United States Government on or about the 4th of January this past year for the silo-type configurations as indicated in this particular viewgraph.

May I have the next slide please.

The next one of course, and all of you who have your plans and specifications are familiar with this one, this is a total over-all siting for the Lincoln construction job, and the sites as indicated around Lincoln, Nebraska.

May I have the third slide please.

The third slide is an artist concept in color of the silo configuration. The model back on the table does not show the launch control facilities, but you can see it in the picture here, with the approach tunnel to the launch site proper.

May I have the fourth slide please.

This slide of course, being identical to the 80th scale mock-up which is at the back of the room, indicates the same information and we won't have to spend any more time on it. You can get a very good look at it by stepping to the rear later if you have not already seen it.

Slide 5 please.

Now this slide is a 10th scale mock-up in identifying color which is located at the Convair-Astronautics in San Diego. Colonel Hammond will cover the extension of an invitation to view the Convair 10th scale model as you see it in this picture at an indicated date.

May I have the next slide please.

The next slide will show the same tenth scale mock-up with the weapon in the launch position.

May I have the next one please.

The follow-on photographs that I have here before you in the viewgraphs are several black and white closeups of the 10th scale. This

particular view showing the 7th and 8th level staging. Also, I might mention, in this picture you can see the spiral staircase which is different than the mock-up we have in the back of the room. The one in the back of the room is already obsolete. Also it shows you the PLS storage vessels.

May I have the next graph please.

The next graph will show you the tankage and the generator facilities and also the elevator facilities, a little bit difficult to see. As you will notice on the staging the generator is above the storage tankage.

May I have the next slide please.

The next three photographs were taken at Vandenberg, California, our OSTF. This shows the stripping of the overburden and the top of the constructed hole (at Vandenberg on the OSTF 2 site). This is being built by the Bechtel Corporation.

May I have the next slide please.

The next one will show you the rebars and will give you the concept of the size of this thing, as you will notice by the size of several men who are walking around in the bottom of this hole. I might mention on this particular construction to date the concrete is in place, which was poured in ten days - from the bottom to the top of the hole after the setting of the rebars.

May I have the last slide please.

This is another view showing the digging or mucking operation to again indicate the size showing a D-8 loader in the bottom of the hole. Now that is all that I have at this time, I can answer questions personally, at some later time this morning. Thank you gentlemen.

Colonel Hammond: Thank you, Major Downing. I would like to introduce Colonel Hastings who wasn't with us at the time we made our first introductions. Would you stand up Colonel Hastings, the Air Force Ballistic Missile representative on the Omaha and also on the Lincoln job here. The one-tenth model which is available at the Convair plant at San Diego was mentioned and we would like to inform you that arrangements can be made for any of you who are interested to visit the Convair plant in San Diego to inspect this one-tenth scale and also full-size models of the propellant loading systems. The trip was arranged for 1 April with a tour at 9:30 or at 1:30. We have to make prior arrangements because Convair has to have advance notice and our prospective contractors will have to be accompanied by personnel from the Corps of Engineers, so any of you who might wish to make this inspection at this time should contact Mr. Larry Langdon of the Omaha District at Jackson 7900, Extension 2346 before the 28th of March, please, in order that we may list your name for 1 April. We will ask you to furnish the name of the person or the

persons who are going and the company to be represented and state your preference for time of tour that is morning or afternoon, 9:30 or 1:30. A similar notice should also go to Mr. J. L. Milliron at Convair Astronautics Division in San Diego. In addition to viewing this model and the models of the subsystems which I think you might find very useful to you, you might also want to try to make arrangements to visit Vandenberg to see some of the work which is being done there. If any of you, at the same time that you are making this trip to San Diego to see this model are interested in seeing some of the actual work in the field on prototypes, you can see something of the nature of the problems that you are going to be faced with here. If you will make this request at the same time, we will undertake to make arrangements to get you into Vandenberg for a view of this work.

This completes the general presentation we have. The floor is now yours for presenting any questions that you may not already given to us in writing. If you have a written question that you are ready to present we will take it here at the table. If you have a question that you would like to present orally, we are ready now to take that. If there are any of that nature we ask that you stand, state your name, the name of the company that you are representing and then state your question clearly. It will be taken down and we will then be able to make it part of the record and also be sure that we are answering the question that you have in mind. After all the questions are presented, we will take a recess and you may have a leisurely lunch and we will work on answering your questions. We will reconvene at 1:30, at which time we will give you the answers that we are able to come up with which I think will be for the most part those which we have previously received. There may be an occasional one that requires some analysis and we might have to tell you that an answer will be given later in the form of a written addendum. I think most of them we will be able to answer here. Again I will caution you to check the addenda which will be issued after this to be sure that you had the right interpretation of the answer that we gave here today.

The meeting is all yours gentlemen, who will have the first question from the floor?

(Questions from the floor received and answered in the afternoon session.)

Thank you very much for coming this morning and if you are interested in hearing the answers to yours or other peoples' questions be back here at 1:30 this afternoon please.

End of First Session

AFTERNOON SESSION
1:30 P.M.

Now for the questions and answers which we have prepared to your questions. As a matter of general information I might start by giving you the names and the approximate contract amounts for the assigned services contracts. You don't need to take this down as we will give it to you in addendum form. These are the contracts that have been awarded to date by the Fort Worth District and by the Kansas City District. This will be for general informational purposes at the moment so that you may know who the suppliers are, whose contracts will be assigned to you and the approximate value of the contracts as we now have it.

The following is a list of contracts awarded by Fort Worth District covering "Assigned Services Contract Items" for Lincoln AFB, Nebraska, and the contractors and the contract amounts.

Name and Address of Contractor	Description of Items	Amount of Contract
A. M. Lockett & Co. Ltd 1701 Mercantile Dallas Bldg Dallas 1, Texas	Package Water Chiller Unit	$77,940.00* *(Includes Mfg Service Rep)
	Rotary Pump	$ 1,980.00
Water Cooling Equip Co 8601 New Hampshire Road St. Louis 23, Missouri	Cooling Tower	$31,950.00* *(Includes Mfg Service Rep)
Dean Hill Corp. 4000 E. 16th Street Indianapolis 7, Indiana	Centrifugal and Turbine Pumps	$38,178.00
Sempco Corp. 347 West 16th South Salt Lake City 15, Utah	Sewage Pumps	$ 6,876.00
Wintroath Pumps Division of Worthington Corp. 1100 South Meridian Avenue Alhambra, California	Submersible Pumps	$15,300.00
Joy Manufacturing Co. 7425 Harry Hines Blvd. Dallas 20, Texas	Air Washer Dust Collector Units	$99,294.00* *(Includes Mfg Service Rep)
The Trane Co. 2nd & Cameron Ave. La Crosse, Wisconsin	FC-10 Air Conditioning Fan Coil Unit	$ 7,110.00
	FC-40 Air Conditioning Fan Coil Unit	$20,835.00
Paul Hardeman, Inc. 10579 Dale Avenue Stanton, California	Propellant Loading Systems Prefabs	$1,765,251.00

Name and Address of Contractor	Description of Items	Amount of Contract
Clarage Fan Co. 619 Porter Street Kalamazoo, Michigan	Centrifugal Fans	$ 18,927.00
L. J. Wing Mfg Co. Division of Aero Supply Mfg Co. 2300 North Stiles Street Linden, New Jersey	Axial Flow Fans	$ 20,430.00
The Harvey P. Bertram Co. 2225 Bogen Street Cincinnati 22, Ohio	Propeller Type Fan	$ 1,980.00

Supply Contracts - Issued by the Kansas City District (Including Mfg Rep where required)

Name and Address of Contractor	Description of Items	Amount of Contract
General Electric Corp. Denver, Colo.	Switch Gear & Panels Approx Wt per Launcher 6,500 lbs	$107,100.00
White Motor Co. Springfield, Ohio	Diesel Generators Approx Wt per Launcher 43,000 lbs	$745,362.00
	Construction Contract	
Otis Elevator Co. New York, N. Y.	Facility Elevators	$255,393.00

There were a number of questions on how the assignment will work. This information together with any estimates where firm information is not available will be forthcoming to you in future addenda. To get to some of your questions now.

Q. Paragraph 44-07b(2), line 5, states in describing the gaseous pressure vessels, that "the weight shall be within the tolerances shown on the drawings." The same requirement was true for Schilling and in addition, bidders were required to furnish on their vessels, ballast in accordance with the following description. "The ballast shall be iron or steel securely banded or clamped to vessels or vessel assemblies. If the contractor is required to provide ballast as specified above, such ballast shall be added so as not to change the center of gravity of the vessels or vessel assemblies from the center of gravity before ballast is added." We can understand the desire to not change the design of the cribbing and cribbing support system due to a change in the estimated vessel weight; however, we call this ballast matter to your attention early in the hope that we can certainly be permitted a cheaper, less restrictive type of ballast than, "iron or steel banded or bolted to a vessel." In our bidding on the high pressure gaseous

storage vessels required for Schilling, we found it necessary to add 630,000 pounds of ballast at a cost of $84,000 in order to comply with this requirement for the nine missile sites. We urgently request consideration of the use of concrete as ballast, and such ballast not be required to be attached to a vessel so as not to change its center of gravity. You can readily appreciate that iron or steel ballast is very expensive, particularly when it must be attached to a vessel so as not to change its center of gravity.

A. We do appreciate this point but there are other more critical reasons than the cost for the placement of ballast as specified and the use of concrete ballast will not be permitted and the requirement that the ballast not affect the center of gravity will be retained.

Q. We note that Drawing AFBMD 1-M-113 shows space envelopes for enclosing the gaseous and liquid storage vessels. Gaseous storage vessels are to be manifolded to one opening for each type of storage, and we certainly laud this versatility allowed bidders on the gaseous pressure vessels. The permitting of manifolding of gaseous storage for any one type of gas to one outlet size nozzle, places all high pressure vessel bidders on a par basis, and eliminates the necessity of worrying with variable external manifolding, and of trying to specify the number of pressure vessels to be furnished.

A. The boys were feeling a bit giddy when they prepared the answer which is that this was worked out with the usual efficiency of the Corps of Engineers and the Air Force after having checked in the normal laudible manner with suppliers and manufacturers, and we appreciate your comment.

Q. Next question - paragraph 44-07e(2)(b)3, on page 44-53 be changed to permit the use of T-1 steel with either tensile strength minimum of 115,000 to 135,000 yield strength minimum 100,000, or tensile strength minimum 105,000 to 135,000 and yield strength minimum 90,000. Elongation in 2" minimum for both types of T-1 would be 17%.

A. This change will be allowed and will be covered in Addendum No. 3.

Q. Please clarify the general contractor's responsibility regarding the installation of materials and equipment furnished under separate contracts. For instance, is the testing, cleaning and installation of the PLS piping to be done under this general contract or under the separate contract for the PLS Piping?

A. All work in connection with the testing, cleaning and installation of the PLS Piping is included in the separate Service Contract and becomes the responsibility of the General Contractor when the Service Contract for this equipment is assigned. This is spelled

out, for instance, in SC-21 of bidding contracts on the PLS Piping available as we told you this morning at Fort Worth District, also at the Tulsa, Albuquerque, Los Angeles and New York Districts. It is also covered in detail in SC-54 of the construction contract specifications for this particular job. We have another question on this later and we will expand on this answer.

Q. Will the silo overhead door details and the shock hanger insert plates be included with the Government-furnished details, and are these items considered to be under Section 22 - "Structural Steel" or under Section 25 - "Miscellaneous Metalwork?"

A. The answer to the first part of the question is no it will not be included in Government-furnished details but the contractor shall furnish the details. Shop details which will be furnished by the Government are limited to the crib. The answer to the second part of the question is that Section 22 the Structural Steel Section, will apply rather than Section 25, Miscellaneous Metalwork.

I should have said at the beginning as we go along maybe the answers are not clear or raise further questions in your mind, feel free to stand up and be recognized and ask for an amplification for the added question that it brings to your mind.

Q. With reference to Volume No. 3 of the specifications, Section 38-14, page 38-19, paragraph F-2, flexible ball joints; this specification now reads "casing, nut and balls shall be of high grade forged steel." It is requested that this specification be changed to read "and/or cast." It must be noted that on other like missile projects, this specification has been changed to include cast items to equal or exceed the existing specifications. It must also be noted that forged items in the sizes involved, in our opinion, would be practically unobtainable and if they were obtainable the cost would be far in excess to be practical. For a recent like project through the Corps of Engineers, Kansas City for the Schilling Air Force Base, this same specification change was requested and was approved.

A. The answer is it will be here also "and/or cast" will be added by Addendum No. 3.

Q. The next question is along the same line, with reference to Volume No. 3 of the specifications, a different section 37-19, page 37-21, paragraph D-2, flexible ball joints; this specification now reads "casing, nut and ball shall be of high grade forged steel." It is requested that this specification be changed to read "and/or cast."

A. The answer is it will be "and/or cast" will be added by Addendum No. 3.

Q. Drawing No. 1-M-113, PLS Prefabs Location and Orientation, and Drawing No. 3-C-4, Site Details are included in Folio 1 and 2 respectively but not on drawing list. The question is are these to be considered as part of the contract?

A. The answer is yes, they are added to the drawing list in Addendum No. 2, which you do not yet have.

Q. The following sheets are listed as contract drawings but are not included in the drawings accompanying these specifications, and there are five listed by number on "Site Dewatering Data" and there are three others on "Helium, Gaseous Nitrogen Gaseous Oxygen Storage Tanks" and two cover sheets. The question is are these drawings to be considered a part of this contract?

A. The answer is that the five Site Dewatering drawings are to be considered part of this contract to be issued with Addendum No. 2. The other three drawings are not a part of the contract and are being deleted from the drawing list in Addendum No. 2.

Q. Revision dates on drawings included in Folio 1 and 2 are of a later date than the date mentioned on the drawing list. Are we to assume that the drawings themselves are correct and base our bid on these drawings?

A. The answer is yes you are to assume that the drawings themselves are correct, throwing in the general caution, is always that they are correct until modified by addendum.

Q. On the prior Atlas Base at Schilling, there was a section in Special Conditions regarding "Measurement and Payment." This section indicated that the furnishing and the installation of the Propellant Loading Prefabs and Interconnecting Piping was not to be paid for under that contract. (That contract too referring to the construction contract.) Is this also true for the Lincoln Site?

A. Yes, the arrangements are the same here, this goes back to the question we were discussing a few minutes ago. The furnishing and installation of the PLS Prefabs and the Interconnecting Piping is covered in one of the service contracts that will be assigned to you at a later date in this construction contract. Again I will give you as references SC-21 on the PLS in the Fort Worth District contract and Paragraph SC-54 in the specifications for this Lincoln construction contract.

It was pointed out to me during our review, the answer period here, that I did not make this very clear in the discussion this morning, the distinction between the strictly Government-furnished equipment and the equipment that will be assigned under the contracts for PLS Piping and other things that we mentioned here. The installation of the PLS Piping to which this question is directed, is included in the bid of the service contractor and will be included in his price at the time the contract is assigned. The Government-furnished equipment, on the other hand, will be Government-furnished equipment to you for you to install and therefore you should include in your bid the cost of the installation even though the cost of the equipment itself will not be included in your contract.

Q. Asked from the floor. My name is Mr. Mowry. This contract that Hardeman has for the PLS is Assigned Service then there is the Government-furnished Equipment and there is also a lot of piping included in the General Construction Contract. Is that correct?

A. Yes, but not PLS Piping, other piping.

Q. Not in Hardeman's contract, but in the General Construction Contract, there is a lot of piping and cleaning and so forth?

A. Yes, water piping, fuel piping and so forth. You're right.

I don't know whether this will clarify or confuse it further, but I did not read verbatim this morning what I had, let me read to you what we had in our prepared statement covering this. The Kansas City District through separate procurement is providing facility elevators, diesel-engine generators and switchgear, air cylinder spring supports for floor support system in the launch control center, blast closures and the silo overhead door hinge systems. The Fort Worth District is providing PLS prefabs and interconnecting piping, PLS piping now, with propellant loading systems and also heating, ventilating, air conditioning equipment and parts. The contracts for the elevators and the propellant loading system equipment also include the installation of these items. The other items do not include installation and all costs in connection therewith should be provided for in the bids for the construction contract.

Q. Asked from the floor. My name is Charles Waterman from Stanley Carter Co., Toledo, Ohio. The previous questions were asked by Judd Mowry of S. J. Groves. Did I understand your answer to this gentleman's question that the mechanical contractor or general contractor shall supply cleaning of PLS piping?

A. No. Cleaning, testing and installation of the PLS piping system is included in the Hardeman contract that Mr. Mowry referred to here which will be assigned to this construction contractor but the price for it is included in the contract amount at the time when it is assigned. Are there other questions on this score while we are on this particular point? We will go on to some other questions now.

Q. The foundation slab schedule chart on Drawing 389-X-3-S-101 shows that a type 4 foundation slab is required on Site 551-4. After checking the drawing we could locate only foundation types 1 and 2. We could not locate type 4 foundation and we would like a clarification on this particular type of foundation.

A. The answer is you couldn't find it because it wasn't there. The reference to type 4 foundation slab was incorrect. Type 1 and type 2 and an added new design which you do not yet have will be the slabs contemplated. The types of bases to be used in each one of the silos will be covered in a future addendum. A type 4 is not there.

Q. Paragraph SC-54B, this gets us back to the question we were discussing just a few seconds ago provides we are not to include in the bid price, cost of equipment and services including applicable installations to be furnished under assigned contracts and that upon assignment the construction contract price will be increased by the amount of assigned contract then remaining unpaid, including the approved change orders. Can bidders properly assume that their bid price should not take into account additional payment and performance bond premium costs to cover costs of unperformed portions of assigned contracts and that in contract price adjustment upon assignment the Government will include such additional bond costs? The next part of the question is - If this assumption is incorrect how will additional bond costs be covered?

I would like to ask Mr. Hole of the Field Office, Office, Chief of Engineers, to answer this one.

A. By Mr. Hole. This paragraph will be inserted in the forthcoming addendum and is identical to one which appears as the final paragraph of the SCs of the Schilling advertisement that most of you have seen. It reads in this fashion:

Bond Adjustments for Assigned Services Contracts. The bonds furnished under this contract shall, without notice to the sureties immediately upon assignment, extend to and cover the work added by assignment to this contract pursuant to paragraph SC-54. No increase will be required in the amount of the penalty for the payment bond. The penalty of the performance bond will be increased by the amounts this contract is increased as a result of assignments so as to maintain 100% performance bond coverage. There is set forth in paragraph SC-54f a list of the items to be assigned and the estimated contract amounts. The contract prices for this contract as bid and set forth in the unit price schedule shall include allowances for the cost of bond premiums to cover the extension of the bond coverage to the Assigned Services Contracts and no adjustment of the amount of this contract will be made for such extension unless the actual amount of the Assigned Services Contracts at the time of assignment vary from the estimated amounts. In that event, adjustment will be made, either up or down as appropriate, based on the applicable bond premium rate applied to the difference between the actual contract amounts at the time of assignment and the estimated amounts.

Q. Next question. Paragraph 2A-04, page 2A-a, states the following: Raising and Lowering of Material. All material raised from or lowered into the shafts must be handled by electric hoists that are powered in both directions and equipped with deadman controls to automatically stop the travel should the operator become incapacitated, except that occasional use of a standard crawler type crane powered by diesel or gasoline engine may be used for lowering or raising heavy construction equipment when approved by the Contracting Officer and only when all personnel are out of the shaft. The comment is our lowering requirements will vary greatly,

some as little as lowering a 500-lb. section of ring beams to lowering a 50-ton tank. We believe that work can be prosecuted much more efficiently and certainly at tremendously less cost to you if the requirement proposed above is revised to permit the use of other than electrical hoists. The bidding documents, when originally issued by your office, for the Titan Facilities at Ellsworth contained the same electric hoist requirements as these specifications for the Atlas, but you saw fit to amend them by Addendum No. 2 to omit the word "electric."

A. We will do the same thing here in a future addendum.

Q. Paragraph 50-03a calls for standard products. Paragraph 50-04 states "Power supply to the charger will be 480 volts, 60 cycle, 3 phase circuit protected by a 15 ampere circuit breaker." Paragraph 50-07 states "Charger shall be supplied, operating from the power source described in paragraph 50-04." Normal commercial practice is for a charger of the capacity described to operate from a single phase service. In general, single phase chargers are less expensive than three phase chargers.

A. The answer is that this will be changed by a future addendum which will allow the single phase operation.

Q. Paragraph 44-07e(2)(c)1 and 3, delete "37,500 psi" and insert "1/2 the minimum yield strength as stated in paragraph 44-07e(2)(b)3."

A. We agree, this change will be made in Addendum No. 3.

Q. Add to subparagraph 44-07e(2)(c)1, a sentence stating "the maximum thickness requirement of ASME Code Case 1204-4, is waived."

A. The answer again is we agree and a change will be made in Addendum No. 3.

Q. Paragraph 50-07j specified a 15 ampere, 2 pole circuit breaker. If a 3 phase charger is insisted upon, should this be a 3 pole circuit breaker?

A. No, breaker is for a single phase control circuit. This is as stated in paragraph 50-07j and is not for the power feeder as appears to be intimated in the question.

Q. Paragraph 50-02 refers to Fed. Spec. W-C-256a which is a specification for charging equipment to recharge industrial truck batteries. The rectifier section of this specification indicates two rate charging. Paragraph 50-07a calls for "Automatically float the battery while supplying normal load of 3 amperes." Paragraph 50-07b calls for "Provide for automatically recharging the battery after discharge within 12 hours. The charger shall have a minimum capacity of 25 amperes." The question is based on that, "Will a two rate charger be satisfactory?"

A. The answer is yes, it will be satisfactory both the automatic float and equalizing chargers are required as covered in paragraph 50-07.

Q. Section 2B-04a "Structural steel shall conform to Fed. Spec. QQ-S-741, type I, except that for welded construction---members one inch or more in thickness shall be type II." Another part of the same question is Section 22-04-C-2 "Structural steel shall conform to Fed. Spec. QQ-S-741, type I with the following exception. For welded construction members 3/8" or more in thickness, type II should be used or type I if certified laboratory tests are furnished showing that the carbon content is not more than .32 percent." Question is, which thickness is to govern, 3/8 or 1" and in either case is type I steel or ASTM-A7 acceptable as long as the carbon content is less than .32 percent?

A. Section 2B-04a will be revised in Addendum No. 2 to read "Structural steel shall conform to Fed. Spec. QQ-S-741, type I or ASTM-A7." We believe that this removes the conflict between the two.

Q. Fed. Spec. W-C-136a covers a variety of type batteries which are General, Diesel Starting, Railway, Marine, Carlighting, Air-Conditioning, and Motive Power. Wood or steel trays are specified in this specification for Railway, Marine, Diesel Starting, Carlighting, Air-Conditioning and Motive Power batteries. No trays are specified for the General Stationary Power batteries of 80 A.H. capacity. Paragraph 50-06 refers to Racks and Trays. The battery specified in paragraph 50-06 is a stationary power plastic container battery. The Fed. Spec. reference does not call for trays on this type battery. Should trays be eliminated in the wording of paragraph 50-06?

A. The answer is no they should not. The trays are required to support the pads under the batteries.

Q. Paragraph 50-07c states charger shall be floor or wall mounted and paragraph 50-07g gives space limitation of a charger of width 2'-0", height 2'-4" and length 1'-4". This is a very limited space even for a single phase charger and if a 3 phase charger was crammed into this space it would make it very difficult for anyone to maintain the equipment. Is this space limitation essential?

A. The answer is that particular space limitation is not essential.

Q. Second part of the question is, Would a maximum height of 60" and a maximum depth of 1'-8" be satisfactory?

A. This we will study further. The envelope will be increased in a future addendum to allow a charger of a larger size to be supplied. We are not prepared to tell you at the moment how much larger.

Q. Asked from the floor. When will information on water table be furnished?

A. This also will be in Addendum No. 2 which we referred to frequently here. We hope to have Addendum No. 2 out in approximately 5 or 6 more days.

Q. Is slip forming permitted?

A. Yes, see paragraph 19-08, line 5, which reads "Slip form construction will be permitted."

Q. Is there any minimum stripping time for the interior silo forms if stationary forms are used?

A. See subparagraph 19-08e, line 4, which reads 'The forms for beams and girder sides, for the columns, and for similar vertical structural members may be removed after 24 hours, provided concrete is sufficiently hard not to be injured thereby." Interior silo forms, stationary type, if they're not supporting forms, can be construed as falling under this 24 hour stipulation. If they are supporting forms for slabs, beams, etc., the stripping is not allowed in less than 6 days.

Q. Section 22-06a of specifications states "Supplemental design drawings of the structural steel for the crib structure in the silo and launch control center will be furnished to the Contractor by the Contracting Officer." Is the term "supplemental design drawings" intended to mean structural shop detail drawings?

A. The answer is supplemental design drawings will be copies of shop drawings that were used on another project and as such will show the structural details which will be required. We will, however, require the Contractor under this contract to submit shop drawings which correspond in all details to these supplemental design drawings and include any other drawings that he or his fabricator found necessary for their shop operations.

Q. In order to permit the use of T-1 steel at an equitable design stress level, as compared to the other design stresses allowed, we ask that paragraph 44-07e(2)(c)1, be revised to delete "37,500 psi" and insert "1/2 the minimum yield strength as stated in paragraph 44-07e(2)(b)3."

A. A similar question to this we discussed earlier, the answer is that it will be allowed in Addendum No. 3 as requested.

Q. Paragraph 44-04d(1)(a), calls for the vessel assembly to be designed to withstand a vertical acceleration of 1.4g whereas paragraph 44-04e(3) calls for the design of the inner vessel on this same vessel assembly to be designed for .4g vertical acceleration. This same difference in vertical acceleration for the vessel assembly versus the inner vessel design, occurs on the topping tank, the liquid nitrogen storage, and the liquid nitrogen helium heat exchanger. Vessels all have the similar differences regarding the vessel assembly and the internal tank. How can a vessel assembly be required to be designed for a 1.4g vertical acceleration and this same acceleration not be passed on to the inner vessel? Isn't this a typographical error that needs specifying as to which acceleration loading shall apply to both the vessel assembly and the inner tank design?

A. The answer to the first part of the question as to how can the vessel assembly be required to be designed for 1.4g vertical acceleration and the same acceleration not be passed on to the inner vessel is that we don't know. It was a typographical error which should be 1.4g in each case.

Q. Next question, should section 38, Piping, be amended to require that all diesel oil piping inside silo to be welded with socket welded fittings in lieu of 150-lb. malleable fittings as specified? It is noted that all valves are specified for this service to be 400 and 600 lbs.

A. The answer is no. On check, we want the quality of valve to be as specified. The quality of the pipe however will be modified by addendum to require schedule 80 for 2" and smaller screwed pipe, and no change will be made for welded pipe which is now schedule 40.

Q. Along the same line, also section 42-A specifies underground oil piping to be schedule 80 with weld fittings. As diesel oil supply from underground tank is taken off the bottom of the tank, quite a hazard could ensue from a ruptured line in the silo.

A. The answer is this will be given further study and we appreciate your bringing this point to us. We don't at the moment have an answer as to what if any change would result from it.

Q. Next question, please advise if any outdoor asphalt playground areas will be included in subject bid?

A. Answer is no outdoor asphalt playground areas will be included in this bid, unless we put it out by addendum, which we have no indication we'll have.

Q. This question came from Mr. Steves and Mr. Harvey of Black and Veatch. Give the name and address of the Architect-Engineer preparing and/or modifying standard plans and specifications for the subject installation.

A. And they are Black and Veatch, 114 West Gregory Boulevard, Kansas City, Missouri, and the Bechtel Corporation, 4620 Seville Avenue, Los Angeles, California. I presumed you would put this question in.

Q. Under PP 19-13-A in specifications, please advise if a manual batch plant is acceptable for batching concrete for ready-mix trucks or stationary mixers.

A. A semi-automatic plant is required, in which batching weights are set manually, mixes are changed manually, and materials are batched automatically. This will be clarified and made a definite requirement by addenda.

Q. Whether dehumidifiers are required for missile pod cooling or elsewhere. If not, is there a requirement for maintaining a condition of approximately 18 grains per lb. dry air or the equivalent thereof?

A. The answer is that missile pod cooling is not a part of our construction package, no other system has the requirements which were listed in the question.

This concludes the questions which we have received. Gentlemen, we will give you one last chance to raise any more, that either you have thought of in the meantime or answers that have given rise to further questions in your mind.

Q. From the floor. My name is Mr. Kay from Morrison-Knudsen. I want to bring to your attention an apparent discrepancy in dimensions on Drawing 3-F-102. The dimension of 29 ft. 9 inches from the center line of the silo to the inside face of the ring beam does not agree with a similar dimension on another drawing.

A. From the floor. My name is Mr. Callahan from Black and Veatch. I can probably answer this, I am not certain that I can, but when the ring beams are installed it is permissible for the ring beams to be inside the outside of the structures. In other words the concrete thickness may be penetrated by the ring beams, and this is probably where the conflict is indicated and it is not a conflict.

Are there other questions or comments?

Mr. Reisser, I may have misunderstood you but when you were reading the weights of the diesel generators, I thought you said 43,000-lbs. per launcher. If you did so, sir, it was given to you in error. Thats 43,000-lbs. per unit or 86,000-lbs.

I read exactly what you gave me which was 43,000-lbs. per launcher and it should now be what?

86,000-lbs. per launcher because there are 2 units in a launcher.

86,000-lbs. per launcher is the correct weight of the diesel generators rather than 43,000-lbs.

Q. Asked from the floor. My name is Mr. Clapp from the Chicago Bridge and Iron Company. All the outer vessels on the cryogenic tanks are being designed for a 20-lb. internal pressure. This would imply that there may exist a requirement to design the innermost vessel for external pressure of 20 lbs. and it is so stated for the liquid nitrogen and the nitrogen-helium exchanger tanks but since it is not so stated for the inner vessels of the oxygen storage tanks what are we to conclude? Is it not required that

these be designed for this external pressure - these inner vessels? Since it is spelled out in one place and not in another we wondered if we are properly adding reinforcing of stiffening on the external design. If there has been some design concept that doesn't require it, I don't know of it.

A. We will take this question and explore it and if it is necessary and appears desirable we will put it in our addendum.

Are there other questions or comments?

Since you're probably not all going to be the successful bidder on this you may be interested in some of the other jobs that are coming up in the future at Lincoln and Offutt Air Force Bases. On next Tuesday, the 22nd, we will advertise for the construction of the liquid oxygen plant and sometime around the 17th of May we will call for bids for re-entry vehicle facilities. Both of these are for Lincoln Air Force Base. On the 31st of this month we open bids for construction of dorms and dining hall to be built on Offutt Air Force Base but in support of this missile program. There will undoubtedly be other smaller jobs coming along as the Lincoln program develops. These are the only ones on which we have firm information at this particular moment. I would like to repeat that if you want copies of the proceedings of this conference to please either leave your name and address here at the front table now or to write us a letter asking that you be given a copy of it. We believe also we should repeat our invitation of this morning from AFBMD and Convair Astronautics for you to take a trip to the plant to see the 1/10 scale model which is the considerably larger mock-up than the one which is in the rear of the room now, of just what is in these silos and how does it all fit together. Again the trip is set for the 1st of April for either morning or afternoon and those of you who want to go let us know who is going and which of the times you prefer. We need to know that by the 28th of March at the latest in order that we may make advanced arrangements to get you in. As I mentioned this morning, you might also find it very profitable while you're out there to stop by Vandenberg and see some of the work that's going on along the lines of the Atlas silo construction there. Some of the other missile jobs not in the Omaha District were shown to you on the slide this morning. Ray Hole has just given me some dates to mention and these are approximate bid opening dates.

Altus which is in Oklahoma, bid opening in late April; Dyess which is in Texas, bid opening in late May; Plattsburg, New York in early June; and Walker which is in New Mexico, in late June. Those are the four additional Atlas jobs and are all very similar to this one we are talking about here today. Well, gentlemen, again we give you last call for any last minute questions or comments that you have. If there are none we appreciate it very much your coming here today. It helps us and we hope it helps you to receive your questions and your comments so that we can in some degree clear up our plans and specifications and make it a little more clearer on the basis in which we expect you to bid. We hope you all to be low bidder even though only one of you can be the lowest. Thank you very much.

Minutes of

PREBID CONFERENCE

WS-107 A-1 Operational Base
Complexes 1 Through 9
Lincoln Air Force Base
Lincoln, Nebraska

Inv. No. Eng-25-066-60-52

10:00 A.M. - 18 March 1960
Rome Hotel
Omaha, Nebraska

PRECONSTRUCTION CONFERENCE WITH
WESTERN CONTRACTING CORPORATION
21 APRIL 1960 - 10:00 A.M.
OMAHA DISTRICT OFFICE
CORPS OF ENGINEERS
OMAHA, NEBRASKA

I. Opening Remarks - Lt. Colonel Hal Schroeder

II. Organization and Functions of Field Office - Lt. Col. Schroeder

III. Progress Charts, Job Progress & Liquidated Damages - L. P. Theriault

IV. Contract Administration, Modifications & Extension of Time - H. D. Anderson

V. Subcontractors - Mr. Price or Mr. Heim

VI. Shop Drawings, Certificates and Samples - L. A. Duscha

VII. Purchase Orders, Priority System & Expediting Assistance
Purchase Orders - L. A. Duscha
Expediting Assistance - M. A. Badtke

VIII. Changed Conditions, Claims & Appeals - H. D. Anderson

IX. Safety - J. J. Veatch

X. Labor Provisions - H. A. Casey

XI. Miscellaneous - L. P. Theriault

Colonel J. J. Haley	Corps of Engineers, Omaha District
Lt. Col. H. L. Schroeder	Corps of Engineers - Lincoln Area
Major L. J. Henderson	Corps of Engineers - Lincoln Area
Mason D. Travis	Western Contracting Corporation
H. A. Casey	Corps of Engineers - Omaha District
H. D. Anderson	Corps of Engineers - Omaha Area
C. J. Lenander, Jr.	Corps of Engineers - Omaha Area
L. E. Seeba	Corps of Engineers - Lincoln Area
M. A. Badtke	Corps of Engineers - Omaha District
C. B. DeLashmutt, 2nd Lt.	AFRCE-MR
Jack Shields	Corps of Engineers - Lincoln Area
Floyd P. Cannon	Corps of Engineers - LAFO-CCE
Frank Hains	Western Contracting Corporation
M. G. Schaller	Western Contracting Corporation
D. M. Sinclair	Western Contracting Corporation
R. A. Fleming	Western Contracting Corporation
R. C. Nurre	Western Contracting Corporation
Lloyd A. Duscha	Corps of Engineers - Lincoln Area
L. Philip Theriault	Corps of Engineers - Lincoln Area
Ralph R. Rader	Corps of Engineers - Omaha District
A. L. Redd	Corps of Engineers - Lincoln Area
F. D. Harlan	Corps of Engineers - Lincoln Area
Jack Veatch	Corps of Engineers - Omaha District
D. J. Kula	Corps of Engineers - Lincoln Area

COL. SCHROEDER: The purpose of this gathering this morning is to conduct the preconstruction conference on the contract with Western Contracting Corporation which has recently been awarded and been given Notice to Proceed for the construction of the Atlas Operational Base in Lincoln; for operational base sites 1 thru 9. I anticipate that some time before we depart from this meeting today that either Col. Hammond, District Engineer, or Mr. Price, Chief of Construction, will attend this meeting. They are attending another meeting at the District, when we left there a few minutes ago, so until such time that they come in I will ask them to contribute what remarks they would like to present to this group. I am the Area Engineer on the job and I would like to make it clear that while we will follow an agenda this morning it is not inflexible and is not formal and I want everyone to understand that our own purpose in being here is to present information to the construction contractor and to gain information from him which will help us both in prosecuting the job as rapidly as we can; and so at any time during the course of discussion if there are questions or if there are requests for clarification as to what has presented, this applies to government people as well as contractors, interrupt and get the matter clarified. We have no set time schedule so I hope we can move right along and clear these questions up because, obviously, we have a number of people here and presumably some of them have something else to do so that I don't want to set an arbitrary time limit on this conference or any part of it. I would like to introduce those people whom I have here this morning. First of all, Mr. Theriault, who is my Assistant Area Engineer, and three people from the Construction Branch who will be dealing most directly with the contractor, Major Henderson, Mr. Reed and Jack Shields. The three Resident Engineers who are presently assigned to take care of the nine sites, Mr. Seeba will be Resident Engineer of Sites 1 to 3, his office will be set up at Site 1 near Eagle; Mr. Harlan will be at Cortland to take care of Sites 4 thru 6; and Mr. Lenander at Seward, to take care of Sites 7 thru 9. I have also here Mr. Kula, who is my Administration man; Mr.Duscha who is Chief of Engineering and Technical Branch and Mr. Anderson who is Chief of Contract Administration. One other introductory remark: all my people and those people who are here from the District have been through this missile business long enough to know considerable about the missile construction job. So I think that the contractor should know that our suggestions and guidance to you during course of the work

to get within the scope of our contract to be based on the fact that all of us have been, or have had some experience in this missile business, and I hope to point out as we go along the way in which we feel that it is different than an ordinary job. I don't want to frighten you in thinking that there is anything serious in building a missile base, it is the procedures, time schedules, necessity for coordination with other agencies are somewhat different than what we apply to our civil works. As the Area Engineer I have been designated as Contracting Officer's Representative, which means that Col. Hammond, the Contracting Officer, has delegated to me certain functions very specific and to some degree very explicit, which I can do in dealing with you. I will not go into details as to what the authority includes as we go thru this thing somewhat deeper we will elaborate as what the authority does include. So I would like to say here that basically the contractor's contacts are first of all with my Resident Engineer at the particular site; secondly, with my office, the Area Engineer at Lincoln AFB. If we are not able to give you a satisfactory answer, then you or we or both of us will refer the matter back to the District where the Contracting Officer will make a decision on the particular matter. But basically I feel that we in the area, or the rest of my boys, will handle any problems that come up or at least get them into the hands of the people who can make the decisions on that particular problem. Work withthe Resident Engineer and then with the Area Engineer before taking the matter before the District. If there is a requirement to contact the Air Force it will be my responsibility to refer that matter to the Air Force. You, as the contractor, will not be able to deal with the Air Force officially as this is a function which I have. I don't mean to say that you will not be asked questions by the Air Force and cannot give your best opinion to the Air Force at the site because the Air Force has responsibility for construction surveillance. They have to make sure they are getting their money's worth and we are giving them the job on time. So that you will see Air Force people on the job and they will have a very definite function and a very definite responsibility as far as directing the work. One other comment on the matter of authority of inspector personnel, my inspectors right down to the individual sites will be instructed to keep the job moving. They will give you a decision when a problem comes up, I will back that decision, and if they can't give you a decision, we will give you decisions as fast as we can. One of the important items in the missile job is to keep the job moving and to avoid delays, because we just haven't the time, we've got to move fast and we will do our best to give you a decision as quickly as possible. We have in the Corps used the

same approach on the missle job as we do on everything else. You Western people have worked for the Corps before. You have a set of plans and specifications. We expect the job to be according to the plans and specifications. We will not require anything more than the specs require and we will not accept anything else. Where there is the matter of workmanship and materials involved, again we will insist on a specification job. We will get into this as we go into it a little later. On the matter of progress schedules as I said a minute ago this missile job is a fast moving job with very,very little time available in which to complete it so you have to plan in detail and we have to know that plan and we have to insist that we get these detailed plans from you as to what you propose to do beyond that which you might normally do. I am sure that we can work out some arrangement on which to furnish the information which we need to know; probably information that you will need to know yourself. We will not require you to give us data that is not necessary. We remind you again that on the missile job we are building only part of the completed facility. When you as the Western contracting firm complete this job it is not a completed facility, it is merely the frame work into which the AF pours a tremendous amount of effort and tremendous amount of equipment in a very short time of their own in order to make it an operational base. So that is why, basically, we must insist for very detailed schedules, so that AF lead time to schedule their activities can be ascertained, so they can make the necessary scheduling in their own activities. We are very insistent in applying safety and labor provisions in the contract. Those two details will be covered in detail a little later on. I will make one remark on safety that is this, there is inherent in this kind of construction basically the construction of the large hole in the ground back up with concrete and filling it full of steel and full of equipment. These number of passes normally do not exist on other jobs.

PART III

COL. SCHROEDER: Mr. Theriault will cover progress charts, job progress and liquidated damages.

MR. THERIAULT: First of all, our general conditions require the contractor to submit within 5 days, a progress schedule. We will insist on a progress schedule for excavation and concrete within 5 days - 30 days for the remainder. Is this agreeable with you.

MASON: Commencement of work with Notice to Proceed.

THERIAULT: Once the progress schedule is approved we have to follow it and the Contracting Officer is the only man who changes it. On liquidated damages, this is a National Security Project and we are not interested in collecting liquidated damages but are more interested in getting the job on time. We want to see the job done on time and we will help you any way we can to see this accomplished.

COL. SCHROEDER: Mason, would you like to make any comments on your progress submission here?

MASON: We have spent considerable time in the development of the progress schedule and feel we will be in a position to submit it initially this coming week--perhaps by the latter part of the week. We are thinking about the entire schedule.

COL. SCHROEDER: You feel you will have sufficient information on your suppliers and subcontractors and that sort of thing?

MASON: I will say that we will have promises or commitments and we have to design around the completion date and to that extent we may or may not be entirely realistic. We contemplate we will be realistic. We still cannot submit a schedule that is going to exceed on slippage beyond your specified dates.

THERIAULT: Of course, in these progress schedules you are to include your materials.

MASON: We understand that.

THERIAULT: Being as this is such a large and complicated job, having a separate progress schedule on procurement is desirable.

MASON: On procurement.

THERIAULT: We have a set up on procurement. We try to put it on the form we are requiring.

MASON: We definitely will have a progress schedule on procurement. It will be predicated on certain mill rollings and certain deliveries which again are predicated on certain things we have to do and certain things you have to do. For example, prior to mill rolling of structural steel of these cribs -- this ties in with your early key dates being the completion of the PLS system we have to receive from you shop drawings for crib steel prior to getting into mill rollings so we will be anticipating on these schedules. We will be anticipating that we will get the shop drawings and we will get into mill rolling and will get delivery.

COL. SCHROEDER: Let me make this comment. We use the word we want a "realistic" progress schedule and we mean just that.

MASON: You mean still consistent with your completion date.

COL. SCHROEDER: I will say this -- if you have reason to believe that it is physically impossible for you to meet those dates then we want to know about it so that we can decide whether it can be accepted or whether or not we are either going to ask you to take action or we will have to take action which will enable you to revise your schedule on completion dates. If we give you a 1 November date for completing something and you have reason to believe now that on the basis of mill rollings that you cannot meet that 1 November date -- now is the time for us to know about it.

MASON: Will add any impending delay of that nature confronts or it becomes apparent to us, we certainly would.

COL. SCHROEDER: We would rather have a slight delay in submission of schedule in order to make it more realistic than to have the complete schedule early which would have a great number of unknowns still in it.

MASON: Let me ask this question. Are we going to have two progress charts? One meeting required dates on a realistic chart and the other meeting realistic dates?

COL. SCHROEDER: I will answer that by saying we are going to have one. I would amplify that by saying one, but I will say for you to give me a schedule which is realistic and if it does not enable you to meet the dates, let's hear about it now. I don't want to be led down the primrose path and find out three months from now that you are behind schedule and we did not have a chance to meet that schedule but your schedule said that we had to have this phase of the work done by 1 November and this is the way we drew the curve.

MASON: I can assure that we certainly won't hide any potential lag or of design. However, in the making out of our initial charts now, we are going on assumptions.

COL. SCHROEDER: I appreciate that but will some of those assumptions be either verified or found to be unsafe a week from now or 10 days from now.

MASON: Yes, but I would say that we are trying to firm up our assumptions at an early date if possible. For example, at the moment we have been promised delivery on ring beams on 16 May which is consistent with our schedule meeting our theoretical bids. That has been developed now; it being one of the first critical items of the job.

COL. SCHROEDER: That was the reason why as an initial thing we were suggesting that with the exception of the ring beams you control the operation as a prime contractor carry your excavation and bringing back up your concrete. We would like to have a realistic schedule on that phase initially so that we can use that for following your initial activity for planning our own jobs and follow with another one at some later date as Mr. Theriault indicated -- 30 days later with complete schedule which we will incorporate with the partial schedule.

MASON: That is about right. We see no objection to that in making the initial schedule--we of necessity will also have to have the end dates in anticipation of the balance of schedule and we have approached it from that standpoint rather than starting the two or three initial basic features of the work. We are going throughout the frame work of the progress but we prefer the initial submission confined to the initial phase of the work and I don't know of any reason we can't do that.

COL. SCHROEDER: I would prefer to do it that way three weeks from now and let me say this--one of my functions and the District Engineers and his staff is to assist you in the resolution of problems. For example, if you are unable through your own efforts to get delivery schedules which will meet these dates, we can at least make the effort to improve those delivery dates or authorize you to take actions which will enable you to meet the delivery dates. We would a lot rather find out about it now than the day before it becomes too late.

MASON: We concur.

COL. SCHROEDER: Can we work on this basis?

MASON: Yes.

COL. SCHROEDER: Does any one have any comments on the organization for submitting progress schedules?

THERIAULT: District, Air Force, BMD and everybody gets in on the final submission which is the idea of this informal meeting of helping you out. Things we see from a different point of view than you do.

COL. SCHROEDER: We will then move into the next item on the agenda.

PART IV

ANDERSON: Contract Administration is the general heading. Let's start off with something that the Colonel has already mentioned. Briefly, the responsibility and authority that goes with that responsibility that is vested in the Area Engineer as an authorized representative of the Contracting Officer. You either have or will have received a letter from the Contracting Officer with an attachment to it with X's in various columns (Area responsibility or Contracting Officer responsibility) which set forth divisions of responsibility in considerable detail,by the various provisions of the clauses of the contract, special conditions, general conditions, etc. Basically the Area Engineer's responsibilities consist of administration, supervision and inspection of contract, and of those the primary responsibility is inspection. The next thing is changing the contract, if we have to, by modification--I will go over that a little further on. The basic difference on our missile contract is there is a little bit different flow pattern for changes. The Area Engineer is vested with greater authority--the design responsibility is vested with the Air Force. Generally speaking, modifications that we make to the contract are in the nature of a using service request to the field office and directly to the contractor. This direct line will get these things out in the quickest way. This divorcement of the design agency from the construction agency in the missile deal also ties into other things that we will get into.

The Area Engineer has quite a wide responsibility for a number of items which I would like to touch on briefly--will make final decisions to correct obvious errors in the drawings or specs, approve material, reject defective work and require corrections on spot and on site field level, require removal of undesirable employees, order facilities for testing, and order removal under Clause 9c, coordination of the work--this will involve coordination between the different subcontractors employed by the contractor and others employed directly by the Corps of Engineers, and a group of contractors employed directly by the Air Force, broadly classified as Associate Contractors; this entails contractors that are not directly under the supervision of the Corps of Engineers. A very major portion is the safety provisions of the contract including shutting down phases of the work and to authorize and control storage areas in the very limited areas and submission of samples and descriptive data. In all of these things there is required a certain amount of verbal contact at site level which is of great benefit and reduces things in writing. Where there is a problem of some magnitude, we ask that

you put it in writing and we will give you an interpretation in writing and we will know who told who what and when. As Col. Schroeder previously stated we will not require more nor will we accept less than the plans and specifications call for. In case of discrepancies that we might run into, on drawings and specifications, and conflicts, we will depend on the design agency for standardization. We are building 9 holes down here and it is desirable that they all be identical, and identical to those the Air Force is building in other locations. It is necessary from an operational standpoint that our 9 holes be identical to those in other localities. If we run into a conflict where there are two possible solutions (whether you can move the piece of pipe to get out of the way of the duct work or the duct work to get out of the way of the pipes) the decision might very well depend what they did at Schilling that can standardize all Air Force equipment.

Payments we should discuss as I understand that is what the contractor is in business for. You will be paid on a progressive basis as the work goes along; these payments will be based on the bid breakdown which will also be used for the progress charts. Generally speaking, it is safe to conclude that the people on the sites will have up-to-date knowledge, even a little bit ahead for progress reporting. It is our intention that our people on site level, after the general breakdown is established, will work out and agree with your people on site that this piece of concrete is 50% done and 50% is very close to agreement. We will put in a pay estimate and get it paid. Generally, the payment will be made on a monthly basis and this is not necessarily a calendar month. For various internal reasons, I would prefer that it close on the 15th of the month so that there is a fairly steady work load. If we get the information in and get everybody to sign the estimate, we have a real good work shop on putting out the checks. Do you have any comment on closing the 15th?

MASON: I would like to raise the question of there being a possibility of bi-weekly or semi-monthly payments.

ANDERSON: If there is not a substantial difference between every two weeks and 2-1/6 weeks, we can basically use the same figures for progress as for payment. It would increase our burden if we go to a bi-weekly payment rather than twice a month--15th and last of the month. I will defer to Col. Schroeder on this.

MASON: Not throughout the entire contract but certain periods of the contract, it would be helpful. Certain sub-contractors on other missile contracts have gotten into distress periods in not having cash on hand to conduct their business and if we have people working under this financial burden, we will not get the best out of them.

COL. SCHROEDER: You do not object to monthly payment but that during the course of the job you might ask to have the payments go from one payment to two payments a month.

MASON: That is right.

COL. SCHROEDER: We will go along with that. Twice per month to coincide with our progress reports. Write us a request to that effect and we will do our best to honor it.

MASON: Based on the 15th closing estimate what would the estimate be before we get the check on hand?

ANDERSON: If we wind up with payment estimate for signature on the 19th or 20th of the month it should clear around the 25th or 26th of the month depending on the calendar month breakdown as Saturdays and Sundays may enter into it. Generally speaking, we will put a check in your hand before the end of the month.

MASON: 15th closing?

ANDERSON: Yes.

COL. SCHROEDER: If you feel you want to increase the frequency of the payment, let us know. As your progress schedule is pretty steep and you would like to see the money coming in more frequently, it may be necessary. At the end of the job, it becomes less important.

ANDERSON: We have in this specification a provision that does not in my experience normally exist in a military job. Paragraph SC-55 permits us to extend advance payment for plant and if we ignore small print it basically states we will pay for material such as tarps, lumber and various other supporting equipment that is used to accomplish the work but is not incorporated into it. This will apply less on this job. Services and hiring of equipment is also included. There are certain stipulations on this setting forth certain actions under SC-55 the contractor must accomplish to get this payment--the quicker this is done the quicker we will get it on a payment estimate. Review it carefully and put it on the right form so we don't get

it tangled up getting your check out later than the 25th. Contract permits and it is our intention to make advance payments for material subject to the stipulation that exists in contract that Area Engineer determines the progress is going along as it should. This again ties back into your getting an approved progress chart for our use in making this evaluation. If there are no questions, I would like to go into the modification procedure.

Basically, this is our modification procedure--Design agency will give us changes directly and we will review to the best of our ability and we will see that these are whole and complete and tell you what the change is and exactly how to proceed. If it takes three or four days to get a clarification, we will get that clarification. First we will send out a MRH Form 660 setting out the changes and refer to sketches and specification changes. You will know it is a proposed modification and sets forth the extent of the changes. It will be transmitted with letter asking you to have a proposal in for that by a certain date. The date that is set will coincide with the date for estimating set up in our shop. If it is at all possible, meet the deadline dates of the initial letter. This does not constitute a NTP and you should not proceed with any work. Notice to Proceed will be issued before you get the formal Change Order. After we have established a price for the change, we will issue a letter and the Area Engineer is authorized to approve modifications up to $25,000 and Notice to Proceed will come out of the Area Office and if the settlement is greater than $25,000 the Notice to Proceed will come out of the District Office. It will tell you to go ahead with the changes as set forth in MRH 660. This in effect creates a written order legal and proper under Clause 3 of contract and creates the change order. When reduced to proper form will be dated the same date as the proceed order. It is possible that in the course of events that when the formal change order is written, the formal change order will be based on a different set of documents but will do the same thing as the Form 660. We may get descriptive changes from the Using Agency which will tell you to go over on Sheet 6, Line No. 3 and add a "2", drawings will be revised and we will get copies to you and formal change order will be based on that. Be sure that the drawings reflect what we agreed to in the first place. One more time let me say, get the proposals in. I realize you have suppliers spread all over but get what pressures you can to bear on them to get their proposals in to avoid the necessity of going on a two-part basis or a unilateral determination depending on what action we can justify. One more item in keeping with special conditions of missile job: In keeping with a special condition which is unique to

missile job, we will ask for your proposal based on no change in contract time. We will want you to give us a proposal to work this modification into the schedule by putting men on night shift or working Saturdays and Sundays, if you are not already doing so. Under any circumstances, make a proposal that you can accomplish this change without changing the end date. Our estimates will be based on the same thing. Naturally, we can expect the price will be somewhat different. As a matter of time extensions on the contract we have mentioned as unique the provisions of paragraphs SC-1 which in effect tells you that you are to let us know immediately when you are confronted with a delay that would normally be excusable under Clause 5 of the contract. The Contracting Officer will review that condition and he has the authority to make a determination that he would rather pay to defray the cost of making up the delay than grant the delay under Clause 5 of the contract. This will almost invariably be after the fact. This increases the importance of timely notice of any known delay or any possible delay which you are confronted with so we can do things to mitigate the delay if it is in our power to do so and so we can make this determination and properly exercise the prerogative we have.

COL. SCHROEDER: Mr. Riggs, do you have anything to add?

RIGGS: Nothing to add. It has been covered very well.

COL. SCHROEDER: Are there any questions?

HUDDLESTON: I would like to make one comment. There are going to be changes and I think it should be considered by you to have a modification set up independent of your other organization. Probably be a great number of changes and you are going to get bogged down money-wise and modification-wise unless you recognize the problem. You have a big modification problem whether guys want to admit it or not.

MASON: Legal personnel or engineering personnel. We recognize it may be a big workload and we will handle it as expeditiously as possible.

PART V

PRICE: The subject of subcontractors is really the meat of the contractor's operations because unless you have good subcontractors and unless you properly control their activities, you are in trouble and so are we. I can say almost on every missile job we built to date our most serious problem has been with subcontractor's delay in procurement of items because of less than satisfactory management on the part of subcontractors and to some extent a lack of management of the subs on the part of the prime. As far as Western is concerned they have done a tremendous amount of work and I think it is safe to say we have never had a contracting firm with as good a record as Western. You have a good record with the Omaha District but don't minimize the problems you are going to have. While you have had a good record you have had contracts with a minimum number of subcontractors. I am going to break this subject down to two major principal parts. You as a contractor will have subcontracts which you awarded yourself. You will also have subcontracts that we have as the Government awarded and you are required to take over and manage. Taking the subcontracts that you award by your own volition at the time and prior to making an award, I urge you to investigate the subcontractor's capabilities very carefully and I mean be careful from the standpoint that the subcontractor may have a very good name and otherwise a very good record but he may still get you in trouble on this job if he has so much other work of equal priority that they can't give you enough attention. Find out what his work-load is and very carefully ascertain his capabilities on the job at the time that you will need them. Be sure he has an organization on the job to manage the job once he is ready to start the work, but more important to ascertain that the subcontractor has the capability and manpower available to him to expedite the procurement of items that he needs to procure and deliver. Those are the things that have caused us a tremendous amount of grief and delay. We are going to talk to you as general contractor. You will be responsible and we are going to look to you first, last and always to manage these people from the word "Go". Another source of problem with subcontractors is their own subcontracting. They will buy certain things directly and they will sub out some of the physical work, sub out procurement of manufactured items and you will have to insist that they submit a list of suppliers and subcontractors so that you know early in the game where this stuff will be made and who will do the work at the job so that you can ride herd on them. In fact, with the way this missile program is going, I am certain in my own mind you will have to have expediters in your own office expediting your own stuff and helping the subs expedite their work. These expediters

will have to physically make trips to the manufacturing plants checking their time schedules to see if they are acceptable to you. In this little matter of time schedules, we have given our Area Engineers on missile work explicit instructions that when you, the general contractor, submit copies of purchase orders to them, we insist that the Area Engineer perform these two major reviews: No. 1 to ascertain absolutely that the items being purchased technically meet the requirements of the contract. We have been seriously delayed and embarrassed in the past because items were purchased which did not meet the requirements of the plans and specifications, were delivered to the job, have identifications on the item that have mislead anyone and until they were installed no one knew they did not meet the specifications. Example with Aminco pipes and fittings. Aminco puts out super pressure fittings that will go up to 8,000# and super pressure fittings with the same identical markings that start at 8,000# and go up to 20,000# and the contractor bought fittings of a lower pressure rating erroneously and bought pipe that would not match the fittings and became installed and all had to be removed and replaced--delayed us two months. One of the major items we have asked the Area Engineer to check is your purchase order to determine the delivery dates of the items are compatible with your construction schedule so when you submit purchase orders keep in mind that we are going to review for at least those two major points. Second category of subcontracts as I mentioned are those that become assigned having previously been awarded by the Government and turned over to you at a later date. I don't remember the maximum time before we can assign them to you, but I believe it is 120 days. As far as I am concerned every one of them will be assigned to you prior to 120 days before you need them. We will want your "know how" and experience in expediting at the earliest practicable date. Keep in mind that once these subcontracts are assigned to you, you are responsible for payment, responsible for all of the things that you would be responsible for as though you had awarded that contract yourself. Those items, of course, cover such things as air cylinder spring support for floor system, blast closures, diesel generators PLS pre-fab and interconnecting switchgear, heating and air conditioning, silo overhead door hinge system. I am not personally familiar with all of the technical requirements of each of these but at least the PLS pre-fab interconnecting piping and pre-fab facility elevator--those particular assigned contracts include both the manufacture and installation. Our past experience tells us that of all of the items on the Atlas installation that have given us the most trouble the PLS system has as a whole. That is one of the principal reasons

we want to make these assignments early in the game. Keep in mind that you are going to be responsible for not only expediting but seeing that they are doing the work right--at least after the time that they are assigned to you. That is going to take a lot of coordination to get the job physically on the job site. One of the things that we are going to unquestionably demand of you at a later date is a delivery schedule of installation of PLS. You are going to need it yourself so that you have work tools and yardsticks that you will personally follow up that these fellows meet a time schedule that is satisfactory with you. We will expect a more detailed type of schedule and installation procedure than we would normally expect. Your overall job progress schedule we will want to review in sufficient time to confer with you in plenty of time and come to some agreement with you in advance. It goes without saying that you as a general contractor will be held responsible for compliance of subs in every respect, technically and time-wise. In that regard, you will have to be so organized on your own parent organization that you can satisfactorily manage these subs. I don't think you as an individual have any problem foreseeing what you are up against as you have been in the business of construction with lots and lots of subs many times before so you have full knowledge of the problems. That is all I have to say.

COL. SCHROEDER: Mason, would you like to give us in general terms the matter of subcontracting what work do you propose to subcontract and what is the status of your arrangements and what part are you now at liberty to indicate that you have placed with someone and what arrangements and work not sure, what arrangements have been made with subcontractors or major suppliers.

MASON: We plan to do all of the work that we can do ourselves. We feel there are two major subcontracts-that being a mechanical and electrical as distinguished from the general. We will do our own mechanical work. Our Mechanical Engineer, Mr. Hains is here today. We will not attempt to do the electrical and will subcontract. Hope to make that commitment by next Monday and perhaps will be a joint venture of local firms of the Omaha and Lincoln Area of people I am sure you will be familiar with. Other trades such as painting that do involve subcontractors we will normally subcontract those trades that are normally subcontracted. I don't believe that any of those trades are in the major category that will involve problems with maintaining our schedule.

COL.SCHROEDER: Are you at liberty to reveal your major suppliers on the pressure and cryogenic vessels?

MASON: We have made an oral commitment with A.O. Smith and they have assured us delivery ahead of requirement. On the cryogenic, we have made a commitment with two firms in mind--Chicago Bridge and Iron and Southwest Welding. We are trying to determine which of those firms will give us the best delivery. The delivery dates on the cryogenic vessels are not as good as the delivery dates on the pressure vessels. As far as structural and miscellaneous steel is concerned, I think that order will go to a Texas firm, a division of Youngstown Sheet and Tube, G-2 who have assured us that they can obtain mill rollings and delivery to meet schedules. This will be dependent on receipt of shop drawings as we mentioned before.

PRICE: I have no personal knowledge of Southwest Welding capabilities and performance up to now. How about you,Mr. Cannon?

CANNON: I am not familiar with Southwest.

MASON: We are trying to assure ourselves that who we do business with that they have the plant available and will not farm it out to 2nd or 3rd tier fabricators.

PRICE: Southwest Welding now has the contract for furnishing cryogenic vessels for Squadron III, Warren.

MASON: We do understand that they have farmed portions of order of Graver Tank. However, Southwest assured us that their portion of the order will be out to give them floor space to do our cryogenics, but we are not satisfied ourselves that they are in a position to do that.

PRICE: Could we make a check some time today before you leave?

MASON: We would like very much for you to. The same thing with Chicago Bridge and Iron if you have the facilities to do that.

PRICE: We can at least check the present status of fabrication of the large LOX vessels and whether they are reasonably on schedule or not. In any event to finally wind up with one very important consideration is the supply of steel for these vessels. Satisfy yourselves they are not going to get into problems with the mills and not get plate when they need it. It seems to me that either one of those firms have the capability of performance. Both of them have been in the business. Chicago Bridge and Iron have really learned a lot of tough lessons at Cheyenne which is definitely in their favor. Southwest Welding is now in the middle of it at Cheyenne III.

MASON: Chicago Bridge & Iron feels that they have benefited from the Cheyenne job. However, their deliveries are very tight on our PLS completion dates--1st completion date 18th of October. We have been shooting for delivery of the tanks concurrently with the rise of the structural steel cribs. Hope we can get the larger vessels prior to topping out the cribs.

PRICE: As an added suggestion--regardless from whom you buy these cryogenic vessels you personally want to talk with their designers in advance what their design might be from this standpoint. Most of trouble delaying cryogenic vessels is occasioned by leaks. They get the tanks welded--start pulling vacuum down and they start leaking. Seems to me that the design of those tanks should be that they permit the greatest amount of welding possible to be accomplished at such a time that they can be X-Rayed and examined during fabrication phase and prior to the testing out phase. If their designs are such that there is a large volume of welding that is unreachable by X-Ray and thereby of questionable character--there is where you are going to lose a lot of time. The design of vessels should have a very important aspect in your selection.

MASON: Is there any question on A.O.Smith?

PRICE: All my remarks are related to cryogenics. No question on A.O. Smith--have always or nearly always met the required completion dates--never missed them very far.

CANNON: The only problems I know of that we have had with A.O.Smith is the cleaning problem and I feel that this will be straightened out.

PRICE: This has just dropped its ugly head on us in Cheyenne. Up to then we had no known problems on cleanliness on A.O.Smith. Even though they were cleaned at the manufacturer's plant and certified by our laboratory upon delivery were found dirty. This is a recurring problem we have had on just about everything. Some of the problem has been because of rusting in the interim between cleaning and delivery to the job site.

MASON: We would like to raise one other question. In all of these pre-bid conferences it has been stressed by the District Engineer that you are not interested in any changes in design, and would tolerate a change only if it don't work. All of the pressure vessel people by virtue of addendum put on the contract quoting on vertical pressure vessels, including A.O.Smith. Whereas Hardeman contract PLS system is predicated on horizontal pressure vessels in that configuration. A. O. Smith does not seem to know where

the change in configuration from horizontal to vertical came about. We have not been able to determine from Bechtel or any other agency.

PRICE: What is this change on?

MASON: The vessels stand upright rather than horizontal and in their horizontal position they come out to a flange that meets the flange furnished by Hardeman which means there is no other manifolding or anything required. If we have vessels delivered to the job that is under pressure that has been certified clean under the Hardeman contract he opens and joints those expansions and under the vertical position to get back down to meet the Hardeman flange, an additional manifold is required to reach those elevations which means that it is actually entirely superfluous--that is a simple connection across the top which eliminates quite a bit of Hardeman's manifolding and different position. Somebody up the line either BMD or Bechtel is aware of this.

PRICE: Is this a permissive thing that you are permitted to install them in a horizontal or a vertical position?

MASON: It is permissive that they may be installed in a horizontal or vertical position but then there is nothing to fill up the gap between the horizontal position of the PLS which Hardeman has in the vertical position of the new vessels. If we could get some research on that, we would certainly like to have it as early as possible. We don't want to waste time submitting the vessels in the vertical position if it isn't going to work. In other words we would rather put A. O. Smith to work on vessels.

PRICE: Your responsibility for both parts of it.

MASON: Yes, we realize that but would we have the authority later or any time after you assigned the Hardeman contract to say "Here let's delete all this manifold."

PRICE: What I am trying to point out is since you know what the assigned contractor is to do,it is your responsibility for putting those two up.

MASON: Yes.

PRICE: If you want to change.

MASON: Well, they can be hooked up by adding this manifolding to meet Hardeman's manifolding which A.O.Smith told us to do. What I am saying is that you are paying for two elaborate manifold systems that are not required at all.

PRICE: Why don't you furnish the horizontal position and have it over with?

MASON: That is the question. They furnish 54 vertical types against the greater number of horizontal types. That is one of the questions plus the addendum to this contract gave that permission to a vertical configuration.

CANNON: Many operations will cause you trouble. It can't be stressed too highly looking at this thing as a little difference animal--provide properly in the schedule for it.

MASON: You might enlighten us on this PLS system completion date hooked up at proper position for 18 October. Hardeman contract calls for delivery of items a week ahead of this. How do you propose those two things tie in to meet our completion date of 18 October and his completion date?

CANNON: Is there a conflict?

MASON: I would not say so much that there is a conflict as there is a superfluous installation there as concerns manifolds. Hains, can you correct me?

If, for example, Hardeman had not purchased the fabrication for this elaborate manifold to meet the horizontal vessels a change in his contract date would eliminate a lot of material and a lot of labor. If in the end this would result in a credit to the Government, I don't know.

PRICE: We will dig into this, but in the meantime we want to take the position that if these guys want to furnish vertical tanks, we will have to be responsible for putting up the piping and fittings.

MASON: That is our position. We are not interested in submitting the drawings on the vertical tanks if it isn't contemplated that these are what they want.

COL. SCHROEDER: Any other questions on that?

MASON: Maybe we are misinterpreting Item 2 CS1 complete Propellant Loading System vessels to be complete 18 October. Does this mean PLS system hooked up.

THERIAULT: Just the vessels in place.

MASON: Just the vessels and not Hardeman system.

THERIAULT: Hardeman system is 18 May.

MASON: We did not know what happens in between.

PRICE: I don't know what all of it deals with but just off hand I would say that it is your responsibility to put in an installation that regardless of its permission to go to an upright vessel, it is your responsibility to hook them up, if there is no conflict in the specs.

MASON: There is no conflict.

THERIAULT: It is a matter of selection.

MASON: I think someone somewhere up the line has come up with the idea but not necessarily just the vessel people.

PRICE: We will look into it more.

COL.SCHROEDER: My only comment is,Cannon,do you know of any lack of standardization or alternate or permissive thing going to be eliminated?

CANNON: This is news to me.

COL.SCHROEDER: It should be nailed down or it will float right down through all six squadrons plus Vandenberg.

PRICE: Let's find out.

MASON: It isn't written as an option in the contract.

CANNON: PLS installation is the most critical item in the job and we can never stress the point too highly. This is the one thing that will hold you up and cause all the trouble. Procurement problem is great. You should consider one or two full time expediters. PLS always come back as the main item. Vessels in the contract on PLS part of process piping which you will wind up with the thing under your control. Very beneficial to schedule as much work as you can and leave as much time for PLS getting everything out of the way so PLS can operate. Keep the area as clean as possible because it isn't a standard operation. Cleanliness standards have to be very high. You can't pour concrete while you are putting in PLS.

PART VI

COL. SCHROEDER: Let's get started again and present the matter of shop drawings, certificates and samples - Mr. Duscha.

DUSCHA: Shop drawings are a necessary adjunct to any construction contract and approved drawings are required prior to inclusion of the article in the completed work. Early submittal is necessary to avoid delay in the construction schedule and to allow for checking time and for resubmittal time, if necessary.

You have either received or will so very shortly a letter from District Engineer outlining a detailed procedure for submittal of shop drawings. Therefore, I will only highlight a few points: 21 copies of each shop drawing will be submitted by the general contractor directly to the Architect-Engineer, The Bechtel Corporation of San Francisco, and will be transmitted by the "Shop Drawing for Approval" form indicated in the Special Conditions. One form must be attached to each drawing or set of drawings listed on the form, and two copies of the form without drawings must be submitted to the Area Engineer as a record of each transmittal to the approving authority.

Material Lists and Catalog cuts are handled in the same manner as shop drawings requiring the same number of copies and transmittal procedure. If items, are part of a unit or system, submit all items of this system at one time so that they may be approved as a whole. Partial submittal only results in delay of approval and in some cases will not be considered until drawings of related items are furnished.

If deviations from the plans and specs are absolutely necessary for some reason and are incorporated on the shop drawing, such deviations shall be prominently marked on the drawing and fully explained with the transmittal. Failure to specifically direct attention to any such deviation will automatically cancel any inadvertent approval.

Paragraph SC-4 of the contract specifications contain some very rigid time requirements regarding shop drawing submittal:

First: The Contractor must within 15 days after receipt of Notice to Proceed, submit to the Contracting Officer for approval, a proposed schedule for submitting shop drawings. This includes reference by item name, description, manufacturer and spec paragraph.

Secondly: Shop drawings of embedded items must be submitted within 30 days after receipt of Notice to Proceed and all other items within 60 days after receipt of Notice to Proceed.

Thirdly: Disapproved drawings must be resubmitted within 15 days after receipt of disapproval.

This will require a high degree of expediting and coordination on your part. It is suggested that your submittal be timed so that items in the early stages of construction be submitted first. We would also suggest assigning an individual with responsibility for expediting and coordinating all submittals.

CERTIFICATES:

Certain material items listed in the specifications require submittal of a certificate, which should be submitted in quadruplicate to the Area Engineer.

The certificates is a notarized affidavit properly signed and dated, which completely identifies the material, shows the contract title and number and states the applicable specification it meets.

Certificates should cover the particular material used in the job and are not general statements. Certificates stating that the material will confirm are not acceptable. They shall affirm that the material does comply.

SAMPLES:

Technical provisions of specifications specifically delineate items for which samples must be submitted and the quantity required. Samples are submitted to the Area Engineer, or to a laboratory designated by him, rather than to the Architect Engineer.

Samples must be labeled or tagged and marked to indicate the following information:

a. Name of material
b. Trade name of manufacturer
c. Place of origin
d. Contract title and number
e. Project specification section to which it applies
f. Applicable specification it meets
g. Intended use

Samples should be representative and should be submitted with sufficient lead time to permit inspection and testing and for resubmittal should the original sample be rejected.

Materials installed in the work prior to approval of the samples will be at the Contractor's risk and no payment will be made until approval has been made.

OPERATION & MAINTENANCE MANUALS AND SPARE PARTS LIST.

A very unique and vitally important requirement of this contract is contained in spec paragraphs SC-4A and SC-4B covering O&M Manuals and Spare Parts & Tool Data respectively. This data is normally required for electrical and mechanical equipment. Specific items are outlined in the Technical Provisions of the specifications.

The O&M Manuals required are those normally prepared for industry and the preparation of original manuscript is not required. The manuals will be used by the Air Force in assembling or compiling a manual for their operating personnel.

Spare Parts Lists and Special Tools and Test Equipment lists are required by the Air Force for aid in stocking the facility for the operational phase. Documentation of this data on a special format as noted in tho specs is required as the Air Force will transfer the information to a electronic data processing system.

I would strongly recommend reading paragraphs SC-4A and SC-4B in detail and including the provisions in all subcontract agreements and purchase orders. Past experience indicates that vendors have not always been aware of this requirement and a consequent delay in submittal has resulted. Constant follow-up by you will be required to insure submission of the total package by 15 November.

TESTING.

Testing is another feature which must be phased in on an accelerated construction program so that the work is not held up by control and acceptance testing of aggregates and cement, testing concrete cylinders and preparing mix designs.

Early submittal of materials for concrete mix designs is essential as the MRD lab will need approximately 45 days to complete a design. Acceptance testing of concrete

aggregates is the responsibility of the Contractor while control tests will be performed by the Government. The commercial laboratory employed by the Contractor must be approved in advance by the Government.

Concrete mix design materials are to be shipped prepaid to the MRD Lab in Omaha in the following amounts for each design:

Cement	4 bags
Sand-Gravel	2,000#
Limestone	1,000#
Air Entraining Admixture	1 pint

Since the aggregates must meet the gradation and quality requirements of the specs, acceptance testing must be initiated immediately to avoid a delay in mix design.

Samples of aggregates will be taken by the Contractor under the supervision of the Government regardless of whether the material will be tested by the Government or by the Contractor.

Contractor is required to cast and cure all concrete test specimens. Suggest these operations be assigned to a single competent individual at each site as uniformity of procedure is essential. Test specimens must be stored at temperatures between 60° and 80° for the first 24 hours after molding. A maximum-minimum thermometer should be provided in the storage area for this purpose. Balance of curing will be in a saturated lime solution thermostatically controlled. Equipment for proper curing must be available prior to commencement of concreting operations.

PURCHASE ORDERS.

Past experience indicates that the principal cause of construction progress falling behind schedule is the delays in the delivery of materials and equipment. Prompt ordering will help alleviate the delays, will permit confirmation of delivery dates and will effect delivery in sufficient time, for orderly progress of the work.

Two copies of each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project shall be furnished the Area Engineer as soon as issued. Orders should be legible and capable of reproduction.

Since purchase orders are used to arrange for shop inspection, to arrange for sampling and testing, and to monitor progress, the following information is required on each purchase order:

1. Date of order
2. Purchase order number
3. Name of supplier
4. Product, including brand name
5. Name and address of manufacturer
6. Location of material
7. Contract number
8. Quantity ordered
9. Date material is required or promised
10. Provision of paragraph SC-4A c "Equipment Data" for electrical and mechanical equipment. This is a special paragraph to insure that all subs are fully aware of requirements for operations manual. Also, include on the purchase order any tests such as shock tests, etc. which are to be performed in conjunction with the material, so we can arrange for Government testing.
11. DX priority rating

Cost figures may be omitted from copies furnished the Government. As Mr. Price stated, we will review drawings to insure that you are ordering the proper material and that the time stated therein is correct.

Do you have anything to add, Mr. Rader?

RADER: Do not submit shop drawings in lump items. Break them down into small packages. They get in quicker and Architect-Engineer can check them faster. Letter which Mr. Duscha mentioned has probably been signed or will be signed later today and be in the mail very soon. I would suggest that you have all of your people in any way that have anything to do with shop drawings to study that letter because it contains a considerable amount of guidance. We have instructed our Architect-Engineer to expedite the review of all shop drawings to handle them within 7 calendar days. I would like to say that you make a complete transmittal and you will have to require in your set up for your people to keep in mind that it should be a complete package with all necessary detail to evaluate your shop drawings for approval. Percentages have been high but have packages complete so that they can be handled. Mailing is an item and deserves special attention. More time can be lost in the mailing of drawings going back and forth. If you send them in the mail, and throw them in any way even in this area it may take as much as a week or ten days. It can take up to 12 or 14 days to get from Omaha to Denver. We have

requested the Architect to use Air Express or Air Mail. If you should use Parcel Post, mark it "Special Handling".

Do not include items that relate to any other items. Break them down into small packages. They get in quicker and Architect-Engineer can check them faster. Some general contractors have required subs to submit all drawings at one time. That only resulted in delaying a lot of items that could have come in separately. Keep in mind that they should be complete packages with all data necessary to evaluate them.

Another thing, if you submit something different than is marked on the drawing. We don't invite you to submit something different and its pretty apt to get turned down, if you do. If you have an idea that you want to submit something different than is called for in the plans and specs, I would recommend that you make a formal application to the Contracting Officer for a change, for it cannot be approved unless the contract is changed. Don't use the shop drawing as a means of trying to substitute materials. Some places in the specifications where it is permissible to make changes, if any are needed. Just because something is better or may work better and you want to use it don't put it on the drawings because it will get turned down.

MASON: All drawings under this contract go to Los Angeles and will be submitted directly to Bechtel for check.

RADER: Yes.

MASON: Direct from Western administrative office or directly from A.O. Smith.

RADER: Directly from Western, we do not recognize a subcontractor. All submittals will have to be through the prime contractor. We have found that by requiring the prime to submit it does two things -- it keeps him better posted on what is going on and better able to coordinate the job. Shop drawings have been very difficult problems and one of the reasons is that word does not get down to the people who are actually doing the work. I would like to offer to sit down and go over shop drawings with your people so that you can get first hand knowledge of problems that we have learned and with any problems in helping you process them.

When can we expect to get the first batch of shop drawings.

MASON: We have some today.

RADER: Send them to Los Angeles.

MASON: We will mail them not later than Saturday.

RADER: What does that consist of?

MASON: Covers ring beams.

RADER: NTP cranked up to get started. Any questions on shop drawings?

MASON: No, I don't believe so.

PART VII

BADTKE: PRIORITIES.

Letter going out to you today explaining the Defense Materials System which covers the controlled materials. This job carries a DX Priority which is the highest priority which can be assigned and is used on the missile program only.

In order for this rating to be effective it must appear on all purchase orders issued by you or your subcontractors. In fact the specifications state that it is mandatory that this rating appear on all purchase orders.

When a company accepts an order with a DX rating they must give it priority over all other orders which are rated DO (which covers military work other than missiles) or over unrated orders such as civil works or industry.

Along with this letter being sent to you today is a written discussion which explains the Controlled Materials. Also along with the letter will be a DMS-4C, which is your application for Controlled Materials. You are requested to complete this form and return one copy to this office. On this form your requirements for materials must be broken down to the type of material, such as carbon steel, stainless steel, copper or aluminum as well as broken down to the quarter in which the material will be required. Preparation of this form is covered in the Written Discussion being furnished your office so I don't believe you will have any trouble with it.

Upon receipt of this DMS-4C we will issue a Form DMS-13 which actually allots you the material requested.

EXPEDITING.

In this letter going out to you today the procedure for requesting expediting assistance is also outlined. All requests for expediting assistance must come thru the Area Engineer. If you have a problem we should know about and if you send it in direct we will send it back to the Area so it will only delay it.

We are willing to help all we can but we do not intend to do your work. It is your contract and your responsibility.

Purchase orders must be written far enough in advance so that items or material will be available when needed.

Also, the Purchase Orders must have the DX rating assigned to each. After ordering you should periodically check to see if delivery will be on schedule. It it is starting to slip and you feel you need help, contact the Area Engineer. If necessary, he can contact us and we will give all assistance possible to get the items back on schedule.

If you fail to check on the progress or delivery schedule until a week before you need the material then it will more than likely be impossible for us to expedite the material to the extent that you would have it when needed. The time to take action is as soon as you recognize that you have trouble or that you anticipate that you will have trouble.

One important item that I wish to emphasize is that the copies of the purchase orders which you send to the Area Engineer must be good legible copies and capable of being reproduced. This is important because whenever expediting assistance is requested or when an item requires source inspection, then it is necessary to reproduce extra copies of the purchase order.

COL. SCHROEDER: In my experience I have been rather amazed at how effective their expediting assistance becomes. It is up to you to push it.

PART VIII

COL. SCHROEDER: Bring up the matter of Changed Conditions.

ANDY: Basically two things that are changed. Condition at the site differs materially from the information indicated on the drawing. Other criteria of an unusual nature differs materially from what you might normally expect to encounter in this type of work. In each case will be found somewhere they request a design or field correction different than is contemplated on the drawing. This, of course, we require to take a look at and issue instructions on how it will be taken care of. We ask that if you do encounter a change of conditions or require a correction of some sort that is not provided in the contract, let us know immediately so we can take a look. If you take action without our concurrence, you act as a volunteer and are not necessarily entitled to collect. If you do encounter an instance in which a change must be made we want to set them up. When you get down to the matter of claims and appeals the procedure is pretty well established--if we can't get along with you on some points it goes into the Contracting Officer who reviews it. We ask one thing and that is that you give us a chance to get along with you first and failing in this, we will pass your request on to the Contracting Officer with our best comments on the situation. Let us try to present all of the facts with no one trying to conceal anything because it just doesn't pay. Findings of Fact that is agreeable to both parties before it goes for higher review. So, if we have a dispute let it all out and see if we can resolve it in the field. I guess that is about it.

PART IX

Mr. Veatch will speak on the next on the subject of "Safety".

With all the contracts you have had with the Corps, I am sure that I don't have to remind you that you have had a very aggressive and active program in the Omaha District. Your firm has an excellent accident experience with the Omaha District on work you have done for us in the past.

Reviewing our record back as far as 1944, we find:

Manhours	8,232,000
Fatal	4
D.I.	28
Freq.	3.77

This is considerably better than most of the contractor's records. In 1956, this office presented your firm a bronze plaque for having worked over one million manhours without a single disabling injury. This is the first and only plaque we have awarded in Omaha. We hope to be able to give you another one before this job is complete. Now before you get to feeling too good I am sure that you are aware of the fact that in this District, safety is enforced in this contract, the same as any other contract requirement.

To insure that all concerned knows what the contract calls for in the interest of safety, I am going to review hurriedly the accident prevention clause that appears in the general condition of the contract.

ACCIDENT PREVENTION CLAUSE IN CONSTRUCTION CONTRACTS.

"31. ACCIDENT PREVENTION

(a) In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract; the contractor will comply with all pertinent provisions of the Manual "Safety Requirements" approved by the Chief of Engineers, 16 Dec 1941, as revised 16 April 1951 and as may be further amended and will also take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for the purpose.

(b) Prior to commencement of work:

(1) Submit written safety program.
(2) Meet in conference with representative of Contracting Officer to develop a mutual understanding.

(c) Control of visiting public.

(d) The contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, exposure data and all accidents resulting in death, traumatic injury, occupational disease, and/or damage to property, materials, supplies and equipment incident to work performed under this contract.

(e) The Contracting Officer will notify the contractor of any noncompliance with the foregoing provisions and the action to be taken. The contractor shall, after receipt of such notice, immediately correct the conditions. Such notice, when delivered to the contractor or his representative at the site of the work, shall be deemed sufficient for the purpose. If the contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such order shall be made the subject of claim for extension of time or for excess costs or damages by the contractor.

(f) Compliance with the provisions of this article by subcontractors will be the responsibility of the contractor."

Other safety provisions in the specifications:

This job will be quite a departure from the earth-moving and paving jobs normally done by Western. This is a crash job with limited time for completion. More and better job supervision. Work area will be confined. Coordination of work by subcontractors. We strongly urge that you write a safety clause in contract with subs. Safety training of workmen will be a problem. Safety indoctrination at time of employment. Weekly "Toolbox" safety meetings. Fire prevention and protection will be a problem. You will not be close to any municipal fire protection. Work to be carried on during winter months.

In order for program to be fully effective it must be completely integrated with each activity. The

responsibility for the application and enforcement of the safety program, must be placed on the supervisory force in chain of command. Each supervisor must be held responsible for controlling accidents. Your overall objective is to complete this job in compliance with the plans and specs, in the shortest possible time and at the lowest possible cost. You can't accomplish either of these if your job is continually being interrupted by preventable accidents. The success of your safety program will largely depend on the interest taken by top management. Management can have the kind of safety program they want.

PART X

COL. SCHROEDER: This brings us down to the labor provisions of the contract which Mr. Casey will elaborate on as he is the District labor relations man.

CASEY: There are a few points on this missile job that I want to specifically emphasize. The usual clauses of the contract involve the posting of non-discrimination posters which we will furnish you--we will send you away with a bundle of forms.

The prescribed payroll affidavit and Form 1581 which is a request for additional classification and rates. In addition to that the prime contractor must always be alert and might say lead the subs around by the nose to get their payrolls in. We require that all payrolls be submitted and checked through the prime contractor. The Area Engineer will enforce compliance with labor provisions of the contract. On this missile contract, and I speak from sad experience, it appears that labor must be handled in a different manner than on ordinary jobs. I would suggest, based on past experience, that you think seriously of employing a full time labor relations representative. Has been our experience in many cases that we have not had the proper coordination from the top side and on down so that labor seems to be giving the orders in the operations by the contractor. We don't have a great amount of trouble with the prime contractors that we do with the subcontractors. I am sure, Mason, you are familiar with some of these instances. Work stoppages cannot be tolerated. As the prime contractor, we would suggest that prior to commencing work you attempt to set up a meeting of all available labor sources in the area. I would like to ask you point blank, do you plan to run a union job or open-shop job.

MASON: Operating as Western, we would run a union job.

CASEY: Have you had any contact with local labor relations in Omaha or Lincoln?

MASON: We have talked to the President of the Building Trades Council, a Mr. McGraw, and several of the business agents having jurisdiction over certain of the area sites.

CASEY: Have you heard of the so-called "Labor Peace Agreement" in effect on Morrison-Knudsen job. It does not eliminate all problems but it sure helps. Labor has pledged for the duration of the project that they will take no action to cause walk offs, cause pickets or cause any work

stoppages, in general, for the duration of the job. Operating at Denver right now in face of the State-wide strike in Colorado by the ironworkers. I would like for you to give serious consideration to plan to employ a full-time labor relations man.

MASON: We have such a classification. We don't think, however, that it would be filled and used 100% of the time. We know there will be some considerable confusion in labor relations due to the fact that it is widely spread and one of locals in the Lincoln area claim jurisdiction over several sites and locals in Omaha claim another and Grand Island and Beatrice and there has been no meeting of the minds over who it does control.

CASEY: Don't you feel that a proposed meeting set up by you would help?

MASON: I don't know if it would help or hinder.

CASEY: Have you had a chance to review the labor set up. Are you going to try and pay the minimum?

MASON: It left us somewhat confused. We contemplate a union job and will pay some union scale and that has to be above the minimum or equal to. There is no division of work and no classification in specifications for the building work. I think that is a bone of contention as far as the Union is concerned.

On the open cut excavation and launch control center work same is considered highway construction. I don't know what classification we have for it. Do you think it is possible that the Government might issue a determination governing all sites.

CASEY: Department of Labor makes the determination. They might on application from the contractor. As you know, this was done on Denver. As you know each site has a different labor schedule and there is as much as $1.25 an hour which is tremendous and if it is your plan to be guided by those minimum rates--that is what I am trying to find out.

MASON: There is a problem there.

CASEY: I might also mention this--if it is not your intention of paying a uniform rate at all sites, you will be required to submit payrolls by each sites. We will have to have it that way. It will cause considerable work on your part. We are not telling you that a uniform rate is the solution. Your subs would be in the same category.

MASON: I am sure that it has been Western's practice to reach an understanding with labor. We have not found any united labor front to talk with. We have only been able to talk to individuals.

CASEY: I understand you have made an application to the Pipe Fitters Union for permission for an international agreement.

MASON: Yes, we have.

CASEY: Only one thing. First of all, all of your labor problems will be taken up directly with the Area Engineer or designated representative to handle labor matters. We in the District will give you all possible assistance that we may on any labor matters that they request our help because we have contact with the National Office. Even at local level, we can kick a few rocks out of the way to get you over some bad spots. It may appear we are looking on the very dark side anticipating a lot of trouble, but based on experience of past two years there has been trouble. Labor is going to do the job for you and it behooves you to work with them. I would like nothing better than to see 100% no labor trouble on this one.

COL. SCHROEDER: Mr. Kula, do you have anything to add?

KULA: On payrolls. We will insist on following the classification that are in the specifications. We sometimes use field classifications which may or may not be valuable and know that we would like clearly just as outlined in the specs and have them send them in promptly and in duplicate. Do you folks plan to send them in by each site or have you given that much thought as yet?

MASON: We will operate out of a central administrative office.

KULA: With the various classificationsit appears that they are broken down almost by all sites. Matter of administration.

MASON: We would have to prepare payrolls by site rather than overall.

KULA: I gave you forms that should be posted at each site. Labor Classification should be posted in a conspicuous place on each site. Also gave you a few safety requirements, first aid books and few of the certificates and you can get all you want by contacting our office.

PART XI

MISCELLANEOUS

THERIAULT: It is your duty to inspect and coordinate work of sub-contractors. You furnish your own layout. We will check you at different times but layout is your responsibility. Government-furnished material will be delivered at the siding. We will require a project sign and a safety sign at each site. Assigned services, Mr. Price took up. Any questions?

MASON: No.

THERIAULT: Item of protection of critical materials, SC-33. Require Guard service. We require in our specs telephones. Have you made any arrangements for telephone service into the sites?

MASON: We have made contact with Lincoln Telephone system and are preparing to install the phone service.

THERIAULT: Method of handling your dewatered water. Five to six thousand gallons of water. Quarters for RE field offices.

MASON: Floor plans for trailers.

THERIAULT: One on each site.

MASON: Shows all three floor plans.

COL. SCHROEDER: Repeat for emphasis on disposition of water which may be something that is a bigger problem in our minds than what it may actually turn out to be. We would very much like as soon as you have an opportunity to do so to find out what local arrangements as contractor planning to make for the disposal of this water outside of the site boundaries. Something you should anticipate and let us know your plans for.

MASON: Are you concerned about all of the sites or concerned about 7 and 8.

COL. SCHROEDER: 7 and 8 primarily, of course. I think that the pattern will be pretty well set by first one you encounter the problem on. You may find an adjacent land owner who would be real happy to get this water and you might go to the other extreme and get one who would raise all kinds of heck about dumping the stuff on his land. It depends upon the topography and their elevations in adjacent area. Please let's not suddenly start dumping water on some

farmer's land and then try to figure what you are going to do about it. Let's not wait until the guy comes barging out there with a shotgun looking for me.

MASON: That could go a long ways.

COL. SCHROEDER: I appreciate that. Both me and the water. I think you should assure me that you have talked to farmer Brown and that he is real happy about your filling his fish pond.

Let's wind up the meeting and get to moving dirt.

ANNEX D

Climatological Data

SECTION 1

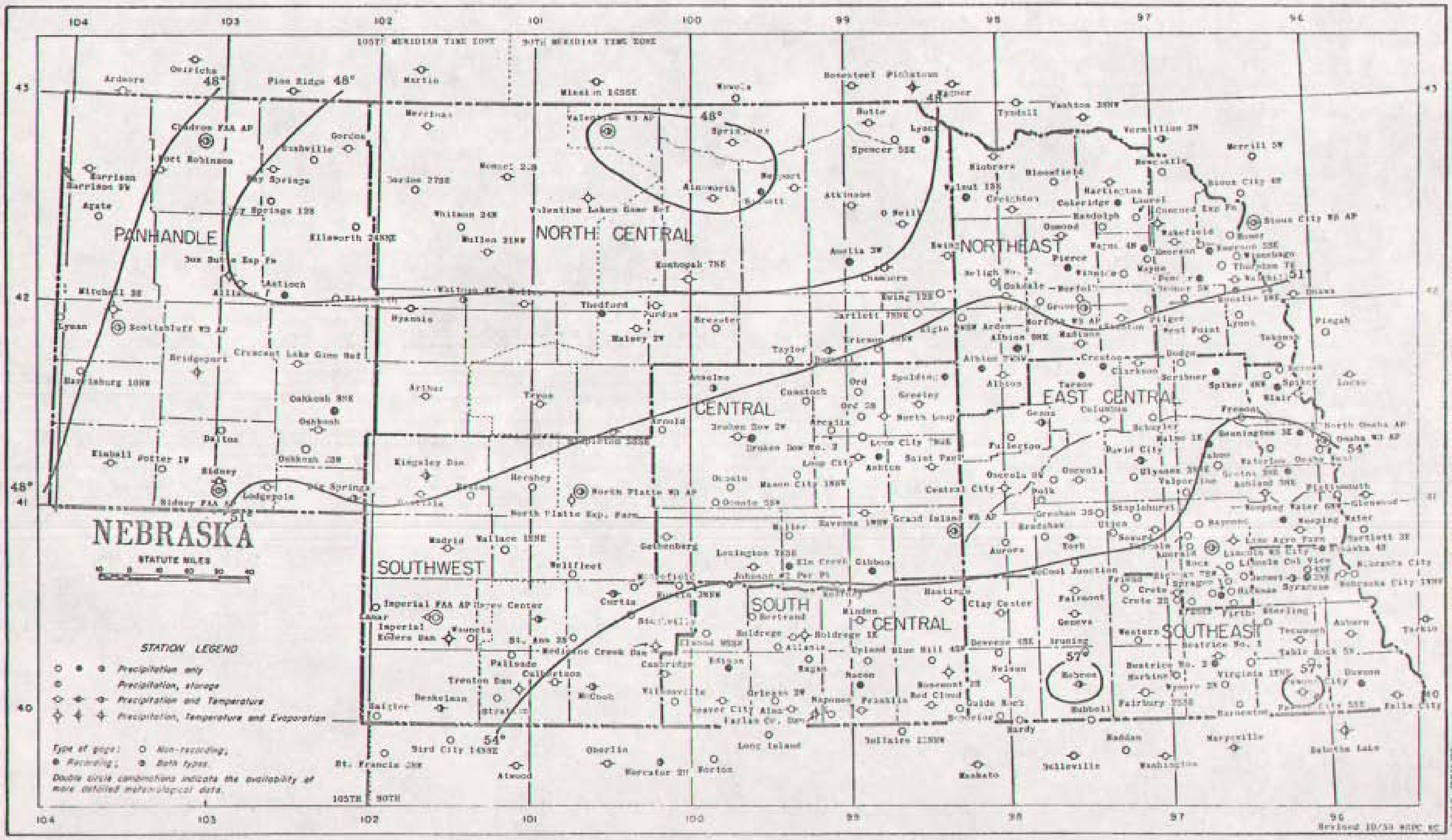
Average Temperature by Months

SECTION 2

Total Precipitation by Months

AVERAGE TEMPERATURE

APRIL 1960



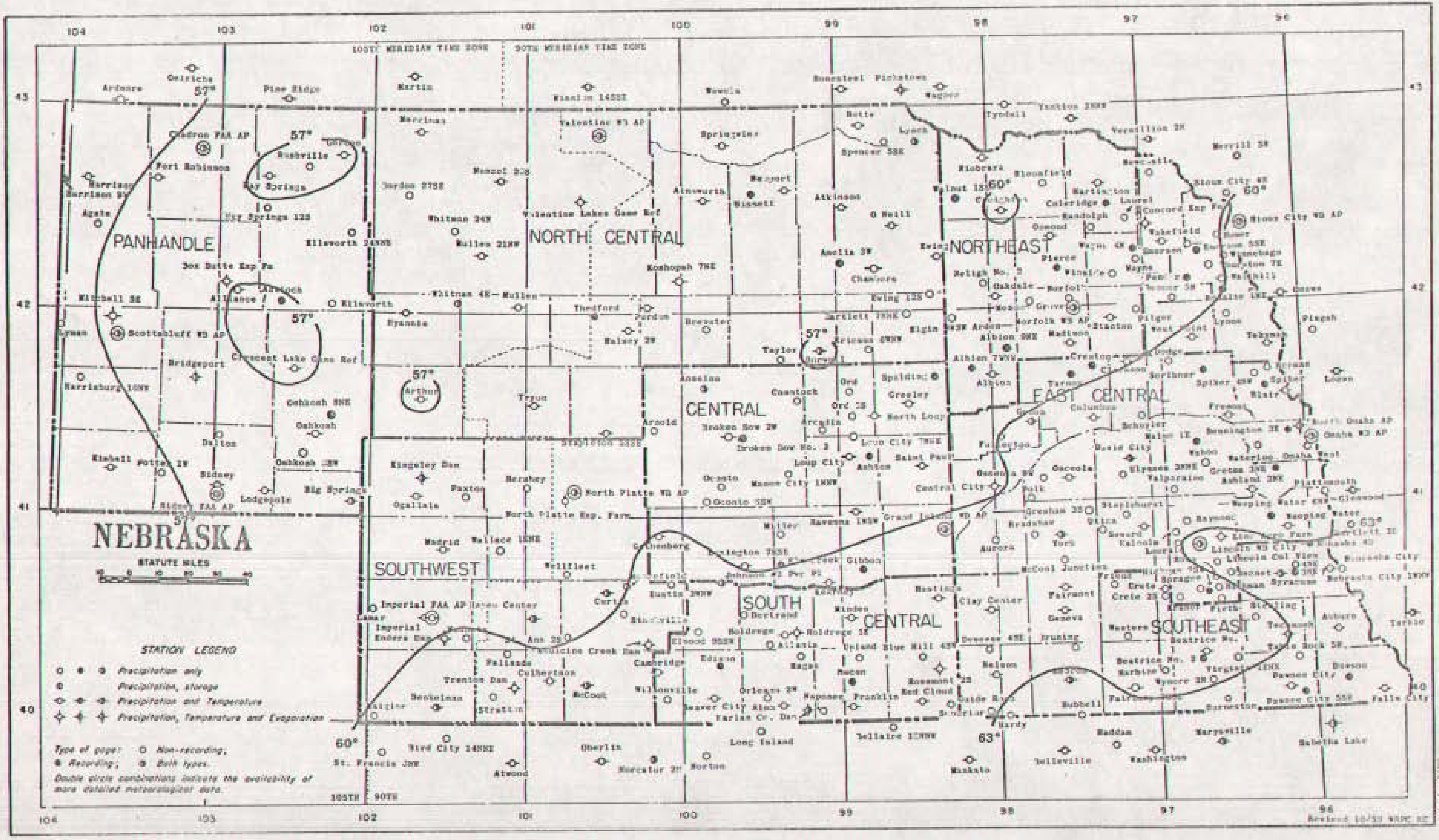
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 2W	Hickman 2NNW	Martell 2NNW	Princeton	Princeton 3S	Roca 2SE
Crete 3ESE	Hallam 2NNE	Hickman 3W	Martell 1W	Princeton 2W	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1W	Holland	Panama 2W	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE

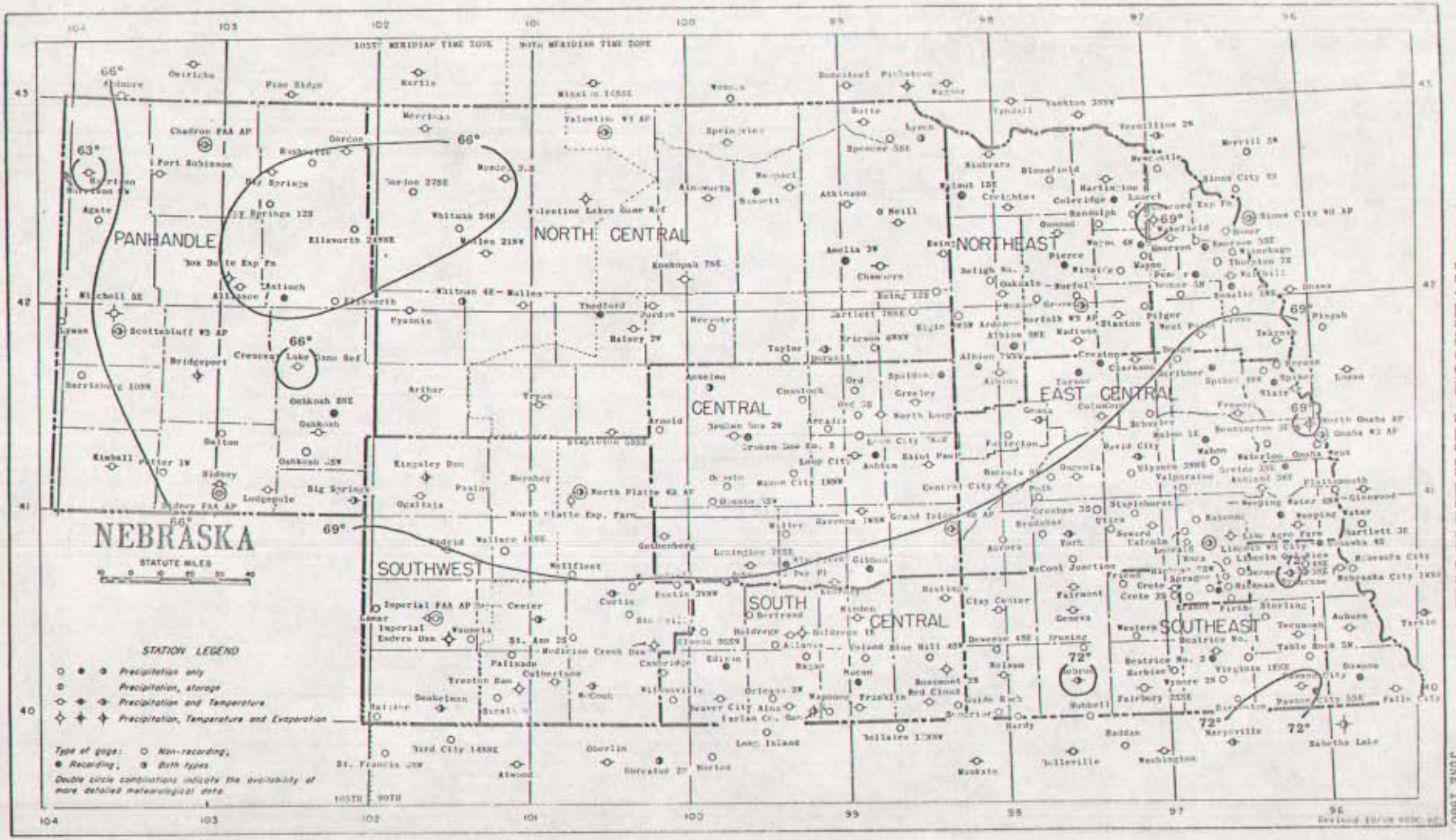
MAY 1960



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 3NNW	Princeton	Princeton 3E	Roca 7SE
Crete 3ESE	Hallam 2NNE	Hickman 3W	Martell 3W	Princeton 2W	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1W	Holland	Panama 2SW	Princeton 3NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.



AVERAGE TEMPERATURE

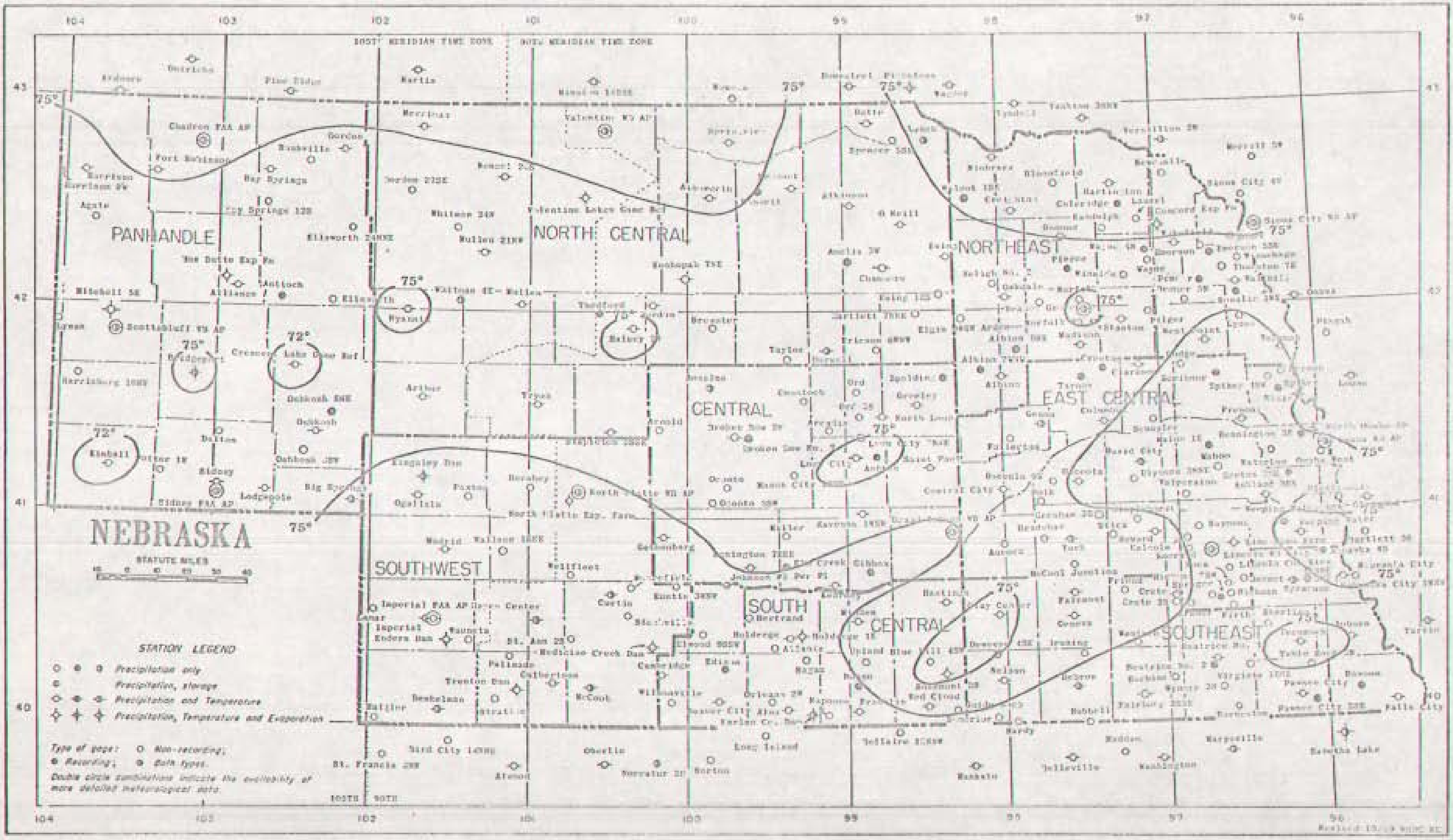
JUNE 1960

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 2W	Hickman 2SSW	Morrill 0SSW	Princeton	Princeton 3W	Rock 7SE
Crete 5ESE	Hallam 2SSE	Hickman 2W	Morrill 5W	Princeton 2E	Rock 2E	Rock 5NE
Crete 7SE	Hickman 5W	Holland	Panama 7NW	Princeton 2NW	Rock 10E	Syracuse 7ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE



JULY 1960

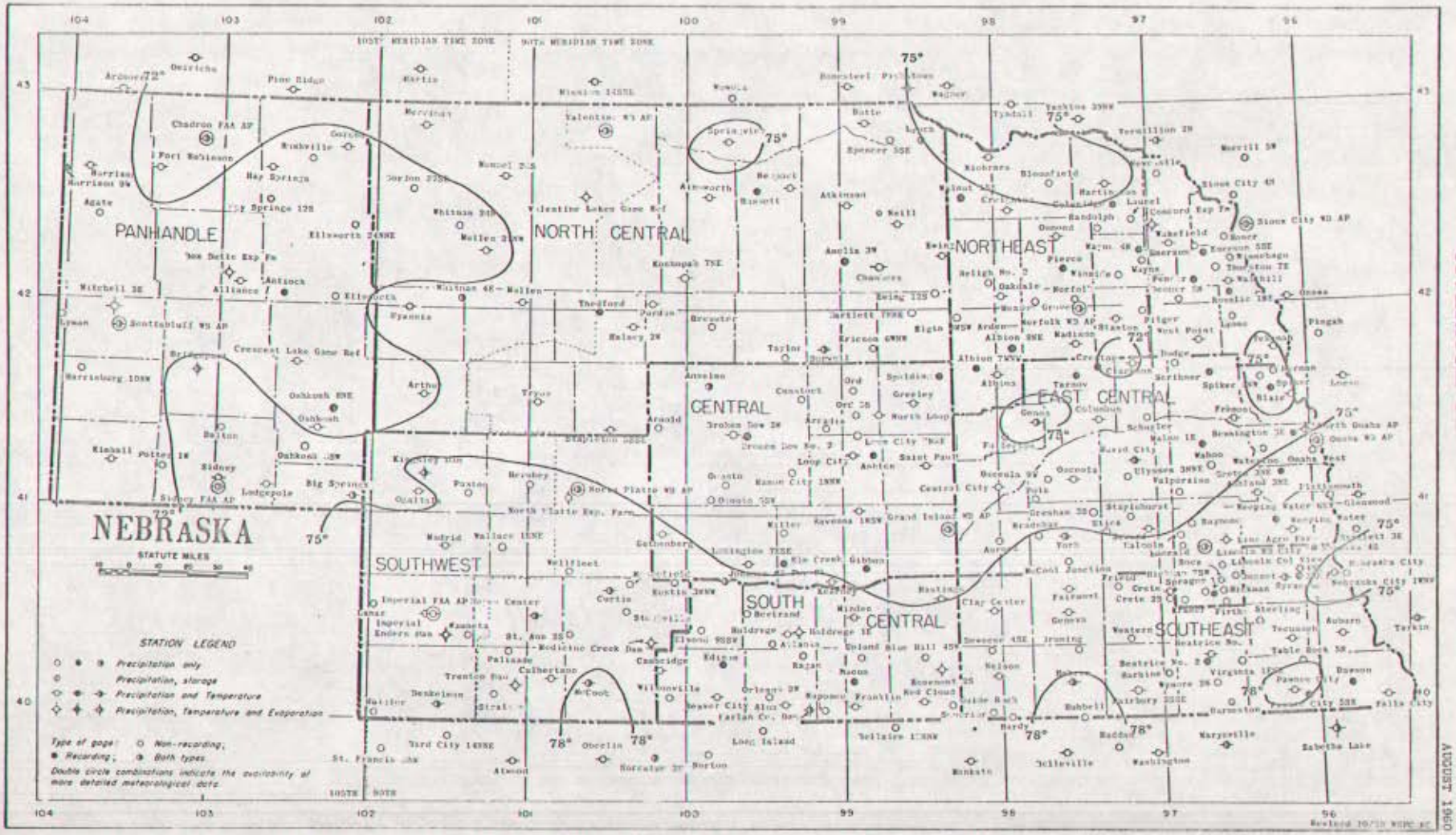
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SE	Hallam 2W	Hickman 2NNW	Martell 2NNW	Princeton	Princeton 3S	Roca 2SE
Crete 3SSE	Hallam 2NNE	Hickman 2W	Martell 5W	Princeton 2S	Roca 2W	Roca 3NE
Crete 7NE	Hickman 1S	Holland	Panama 2NW	Princeton 2SW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE

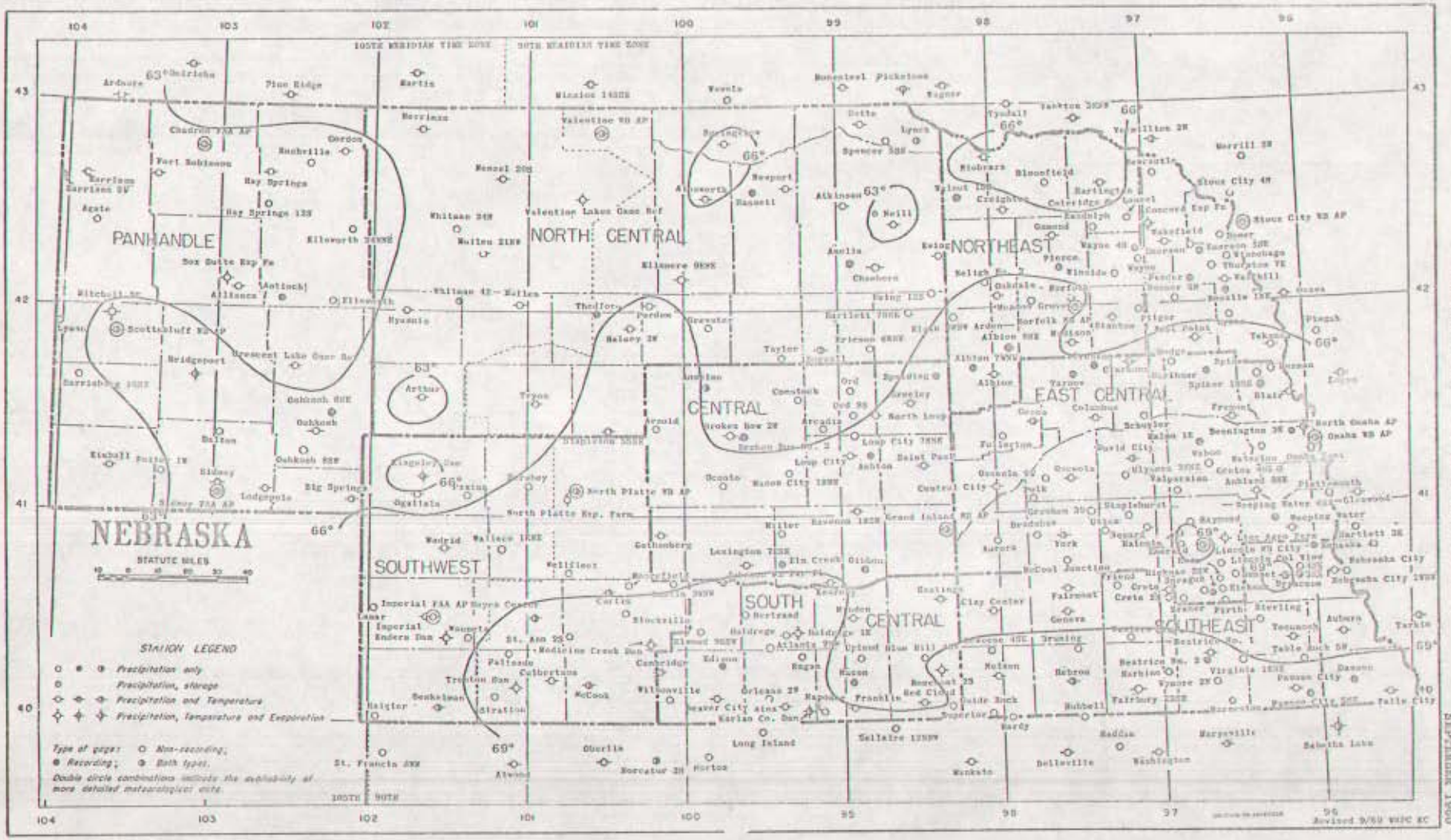
AUGUST 1960



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW, Crete 3ESE, Crete 7NE, Hallam 3W, Hallam 2NNE, Hickman 2NW, Hickman 2W, Holland, Martell 2SSW, Martell 5W, Panama 2WW, Princeton, Princeton 2S, Princeton 2WW, Rock 2S, Rock 4NE, Rock 2SE, Rock 5NE, Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

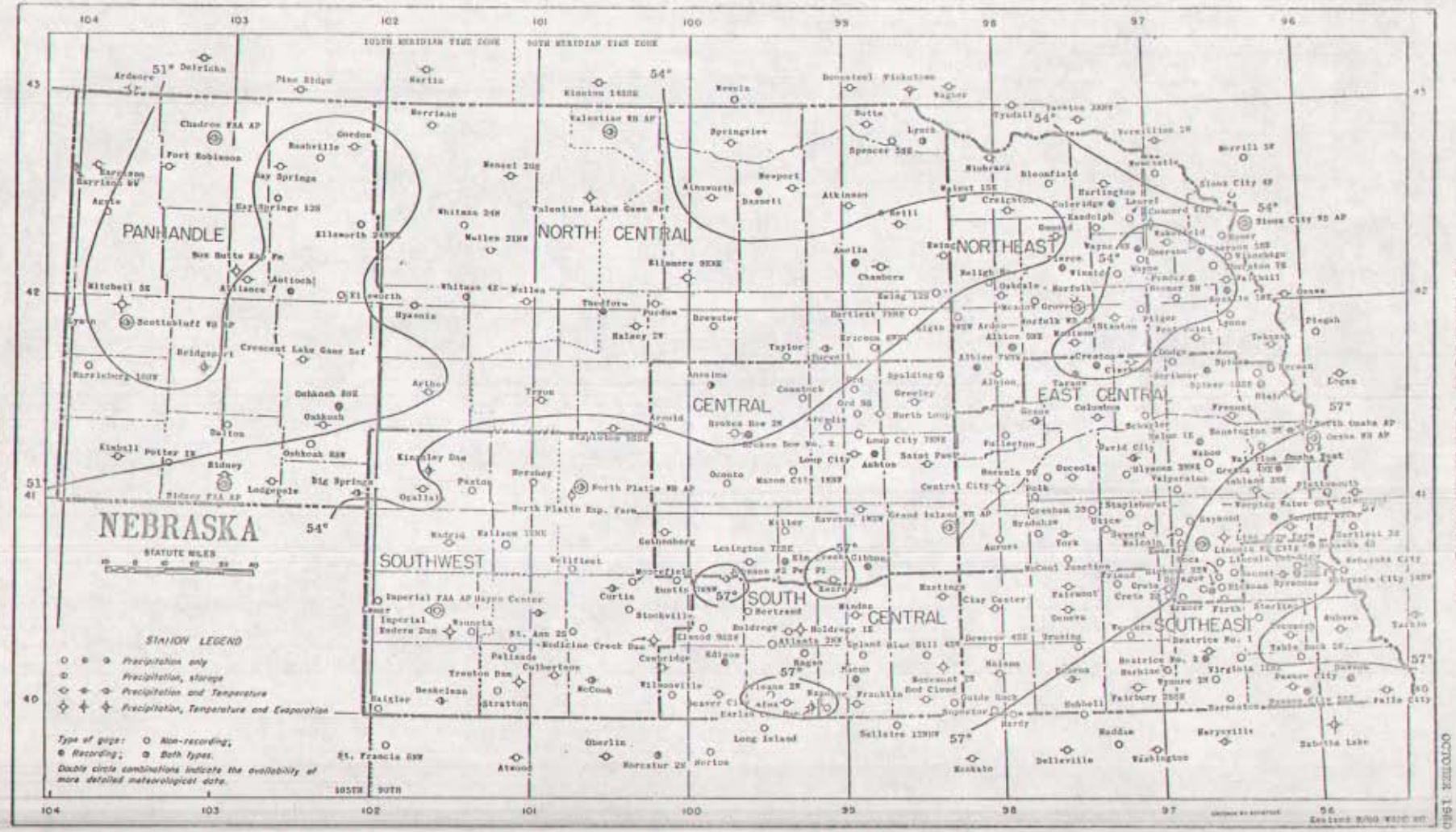


The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW
Crete 3SE
Crete 7SE
Hallam 3W
Hallam 2NE
Hickman 1E
Hickman 2NW
Hickman 3W
Holland
Martell 2NW
Martell 5W
Panama 2NW
Princeton
Princeton 2S
Princeton 2NW
Roca 2S
Roca 1NE
Rose 2SE
Rose 5NE
Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

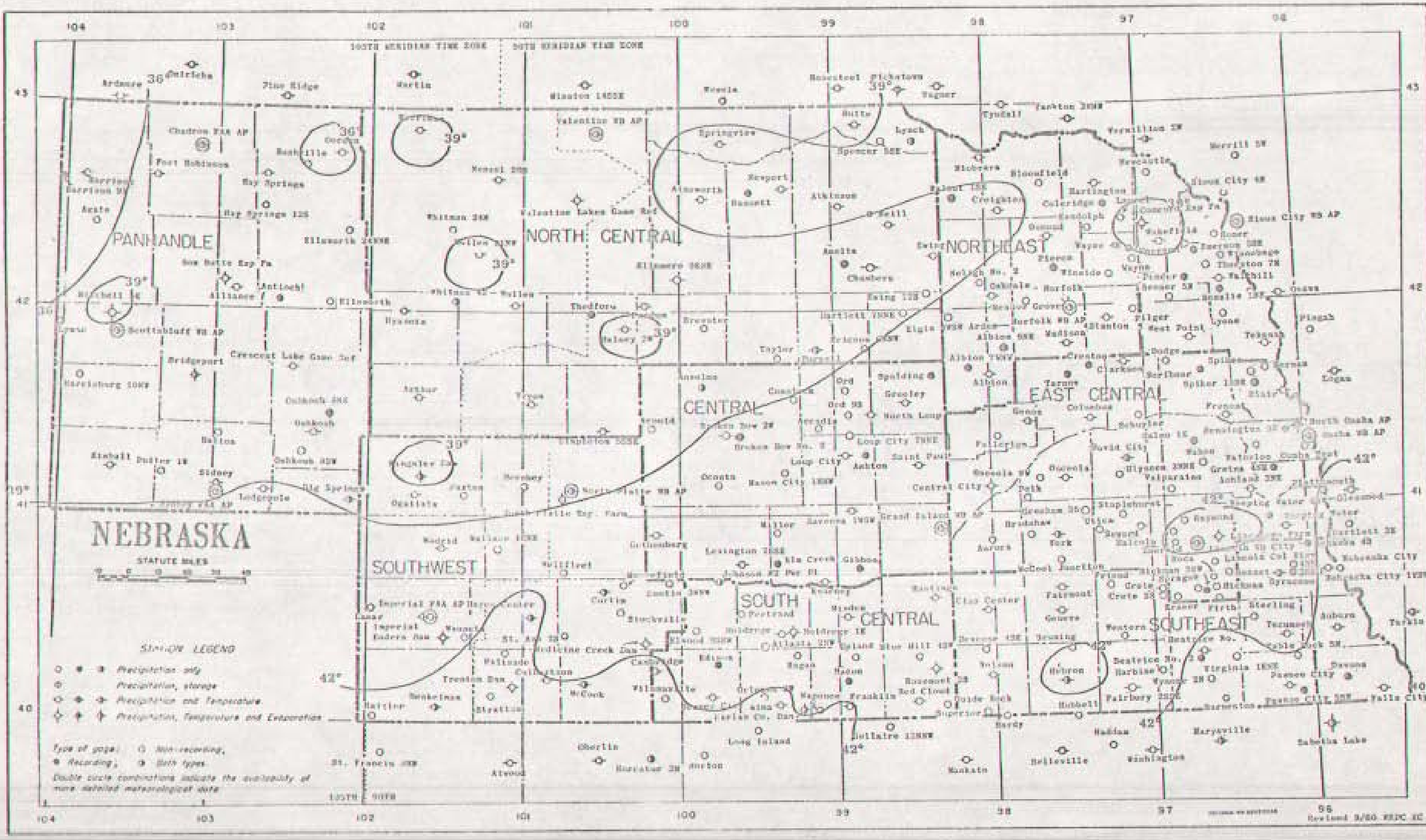
Bennet 4SW, Crete 3SE, Crete 7SE, Dallas 2W, Dallas 2NNE, Dickens 1E, Hickman 2WSW, Hickman 3W, Holland, Martell 2WNW, Martell 5W, Panama 2NW, Princeton, Princeton 2E, Princeton 2NW, Princeton 3E, Rock 2S, Rock 13E, Rock 2SE, Rock 5NE, Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

OCTOBER 1960

AVERAGE TEMPERATURE

NOVEMBER 1960

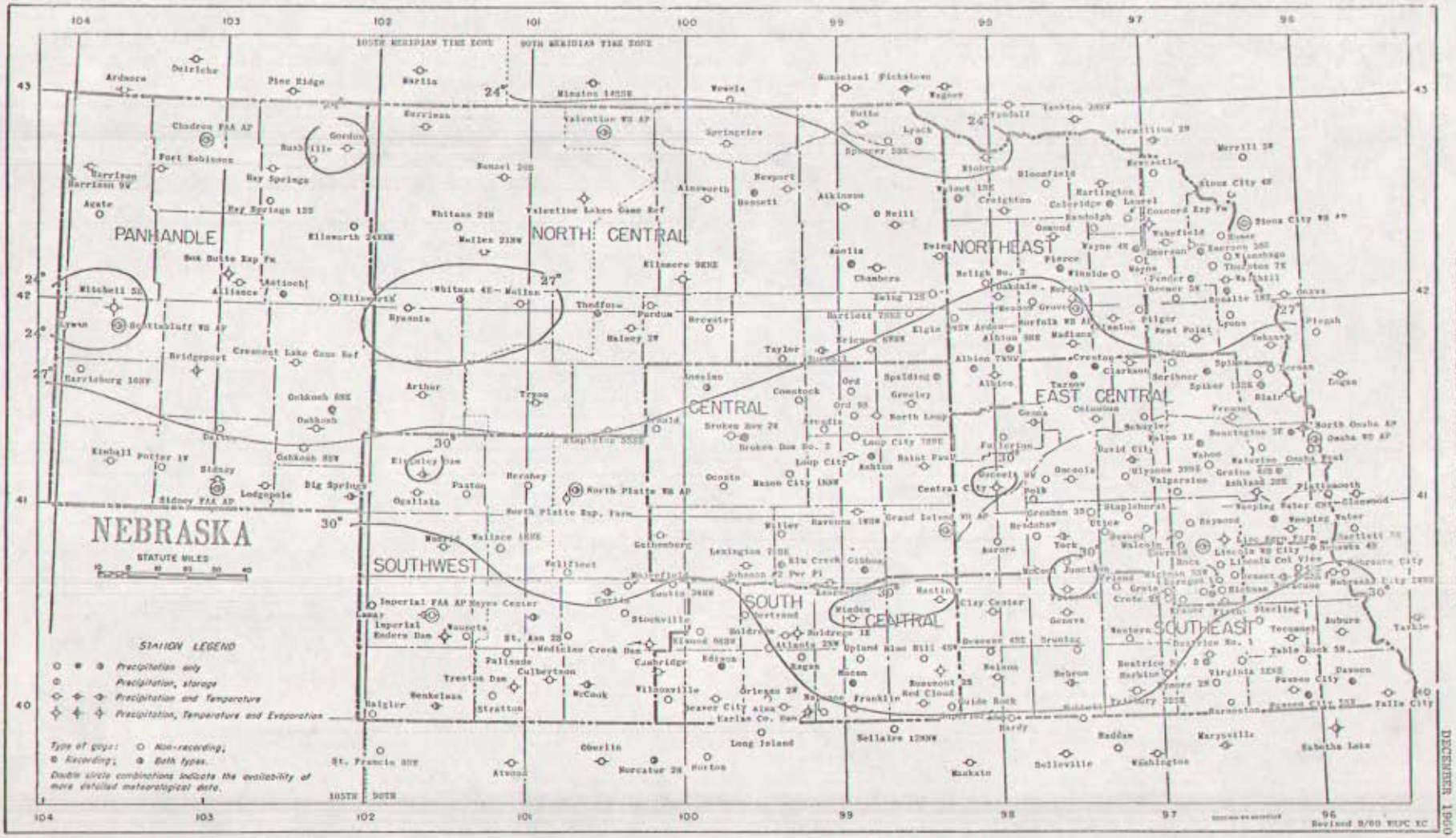


NEBRASKA
STATUTE MILES
100TH MERIDIAN TIME ZONE
90TH MERIDIAN TIME ZONE
PANHANDLE
NORTH CENTRAL
NORTHEAST
CENTRAL
EAST CENTRAL
SOUTHWEST
SOUTH CENTRAL
SOUTHEAST
36°
39°
42°
STATION LEGEND
Precipitation only
Precipitation, storage
Precipitation and Temperature
Precipitation, Temperature and Evaporation
Type of gage: Non-recording, Recording, Both types.
Double circle combinations indicate the availability of more detailed meteorological data
Revised 9/60 FRPC KC

Hallam 3W
Hickman 3W
Princeton
Princeton 2N
Princeton 2NW
Roca 3S

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

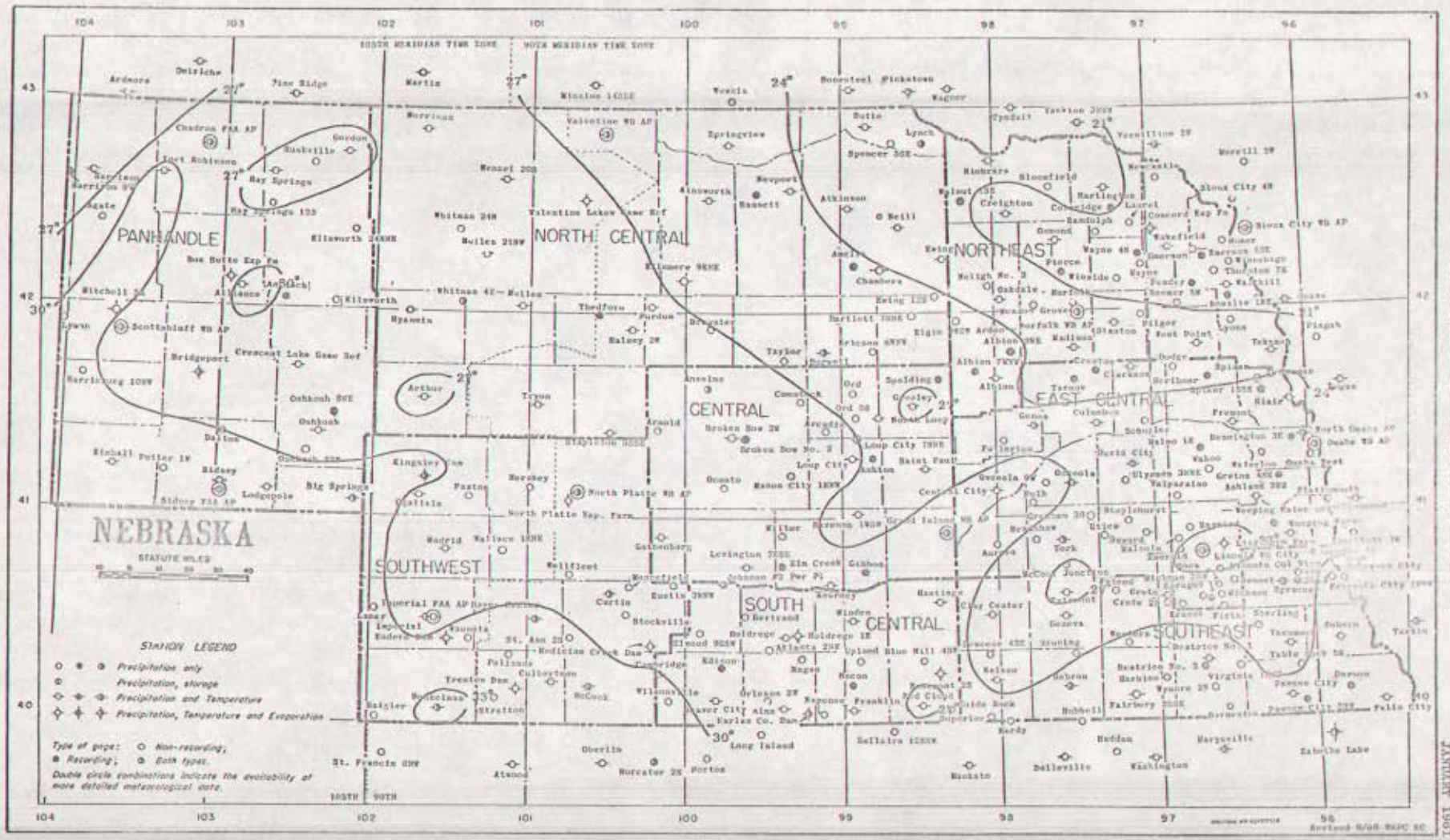
AVERAGE TEMPERATURE



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2WSW	Princeton	Princeton 3N	Roca 2SE
Crete 3SE	Hallam 2NNE	Hickman 3E	Martell 5N	Princeton 2N	Roca 3S	Rock 5NE
Crete 7NE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

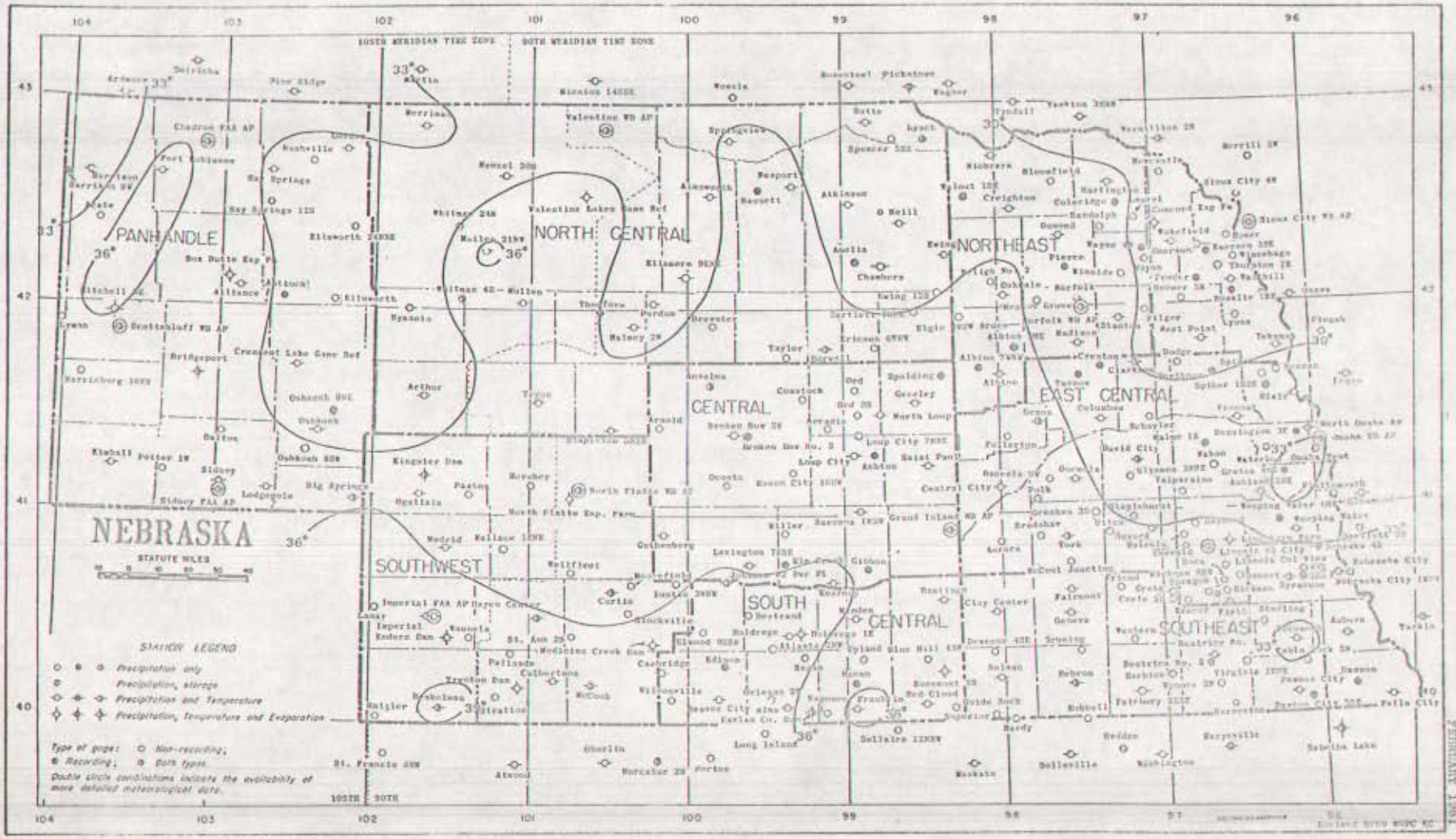
ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3E	Hickman 2NW	Martell 2NW	Princeton	Princeton 3E	Roca 3SE
Crete 3SE	Hallam 2NNE	Hickman 3W	Martell 5W	Princeton 2E	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1E	Holland	Panama 2W	Princeton 2NE	Roca 1SE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

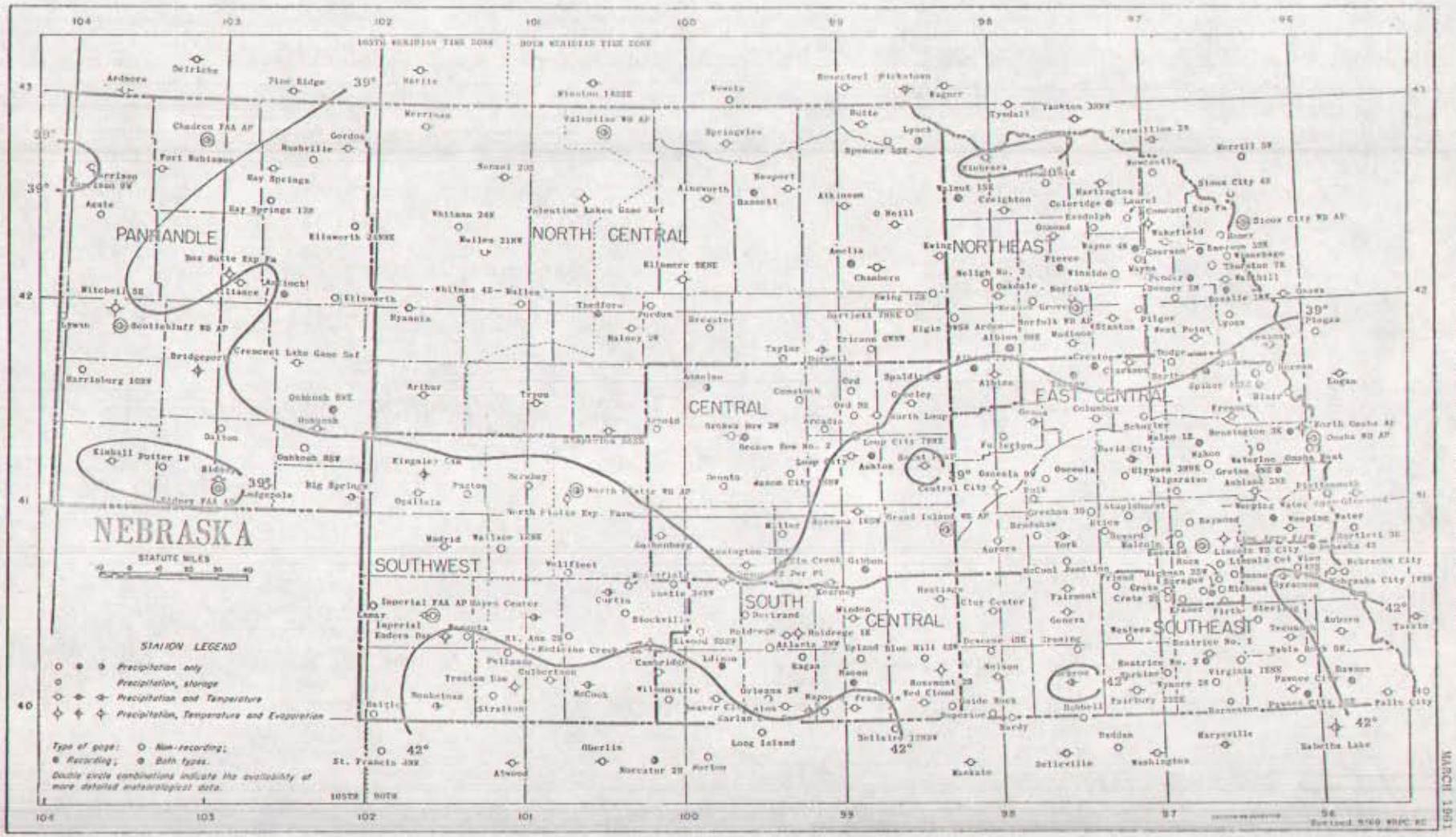


The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SE
Crete 3SE
Crete 7NE
Hallam 3W
Hallam 2WNW
Hickman 3W
Holland
Hickman 2NNW
Hickman 5W
Martell 2WNW
Martell 5W
Panama 2NW
Princeton
Princeton 2E
Princeton 3SE
Princeton 3E
Rock 2S
Rock 3SE
Rock 2SE
Rock 5NE
Sprague 1SSE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE



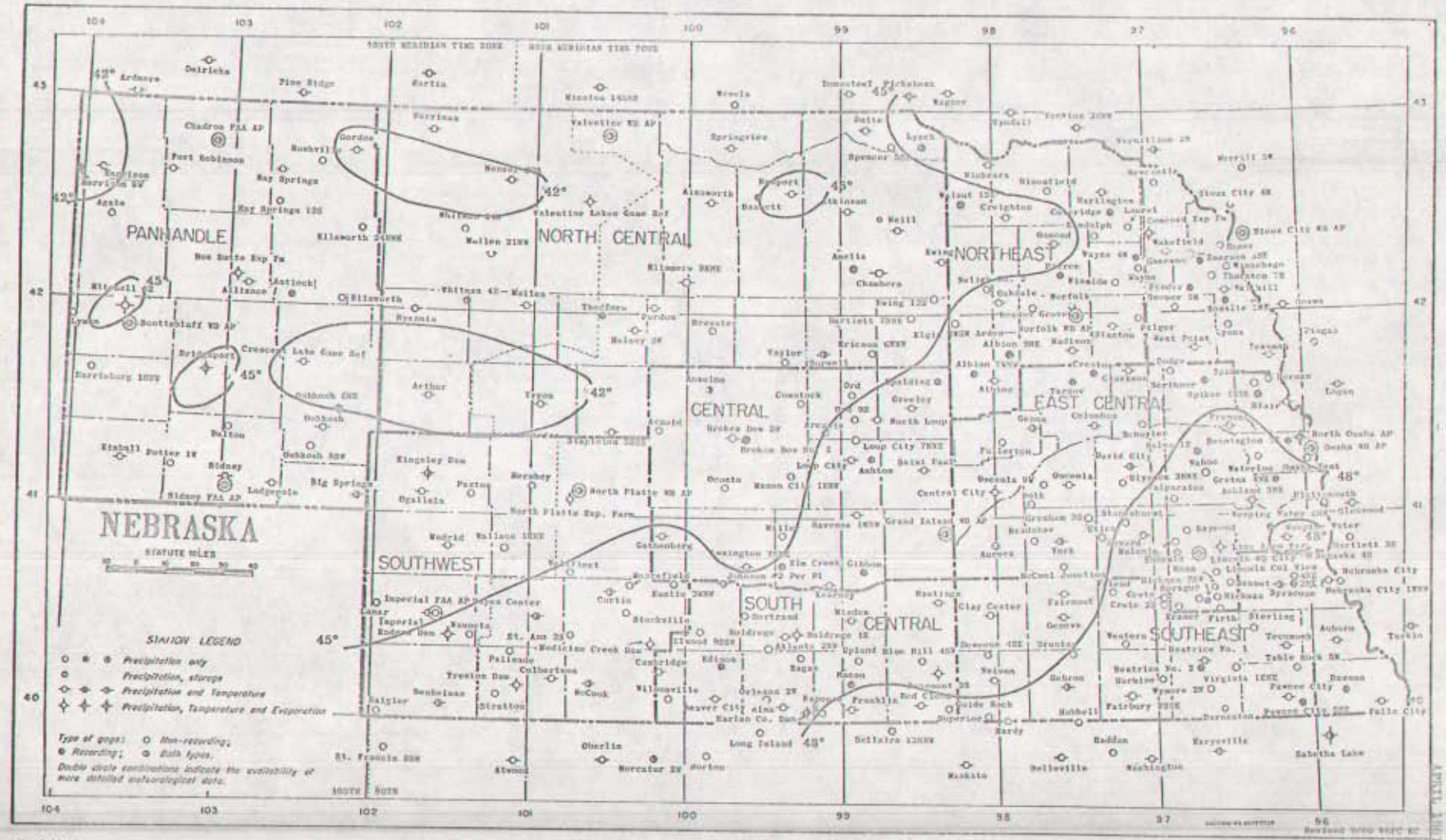
MARCH 1941

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 2W	Hickman 2WSW	Martell 2NNW	Princeton	Princeton 3N	Roca 2SE
Crete 3SE	Hallam 2SSE	Hickman 3W	Martell 5W	Princeton 2N	Roca 3N	Roca 5NE
Crete 7SE	Hickman 1N	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE

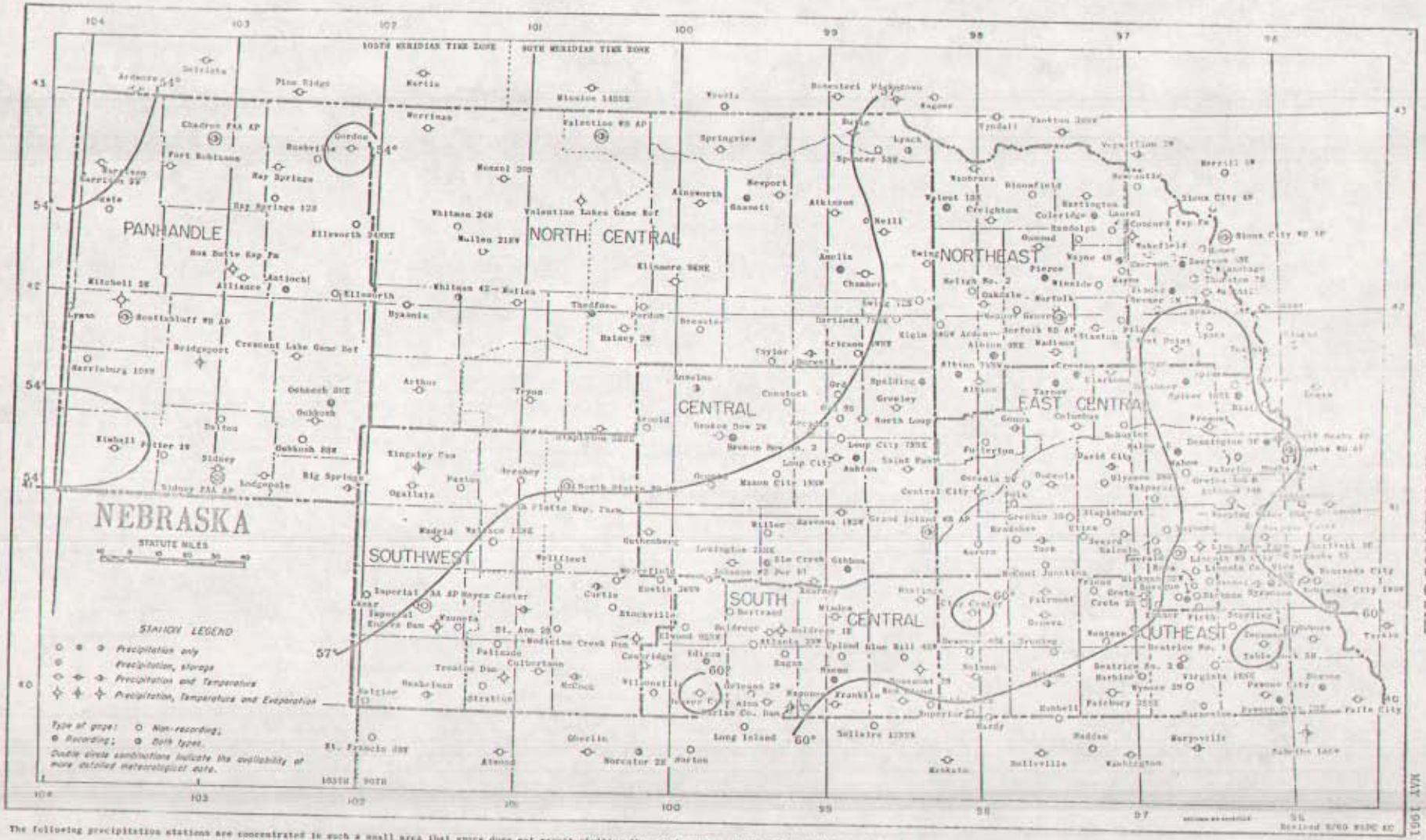


The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2WNW	Princeton	Princeton 3W	Roca 2SE
Crete 3SE	Hallam 2WNE	Hickman 3W	Martell 3W	Princeton 2W	Roca 2E	Roca 5NE
Crete 7NE	Hickman 1W	Rutland	Panama 2NW	Princeton 2NW	Roca 3NE	Sprague 1ESE

*ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE

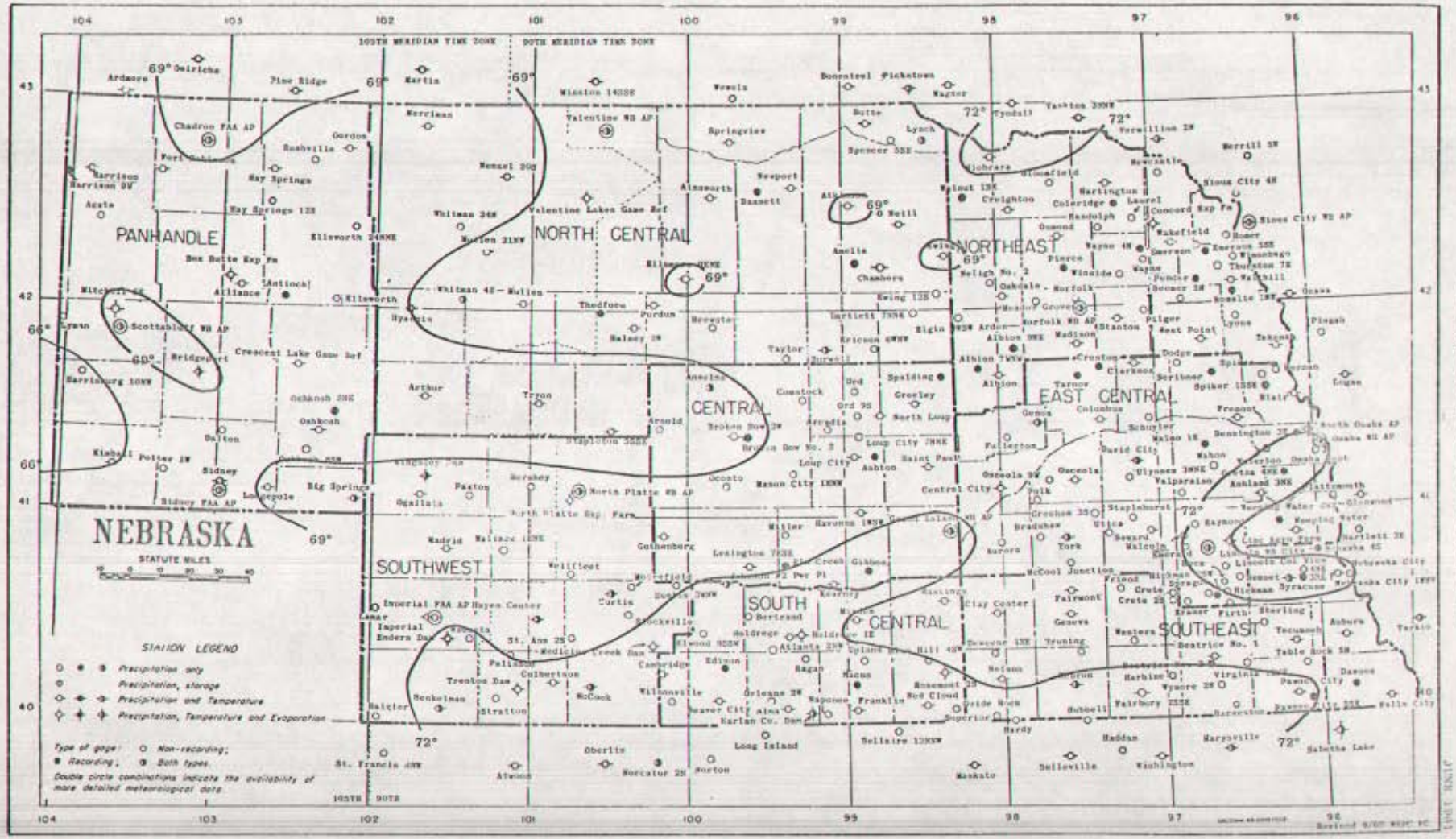


The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bassett 4SW
Crete 3SE
Crete 7SE
Hallam 2W
Hallam 13NE
Hickman 1E
Hickman 2WSW
Hickman 2W
Holland
Hartsell 2SSW
Pirdell 5W
Princeton
Princeton 5E
Princeton 2SW
Princeton 2W
Rose 2S
Rose 1NE
Rose 3SE
Rose 5NE
Sprague 1SSE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

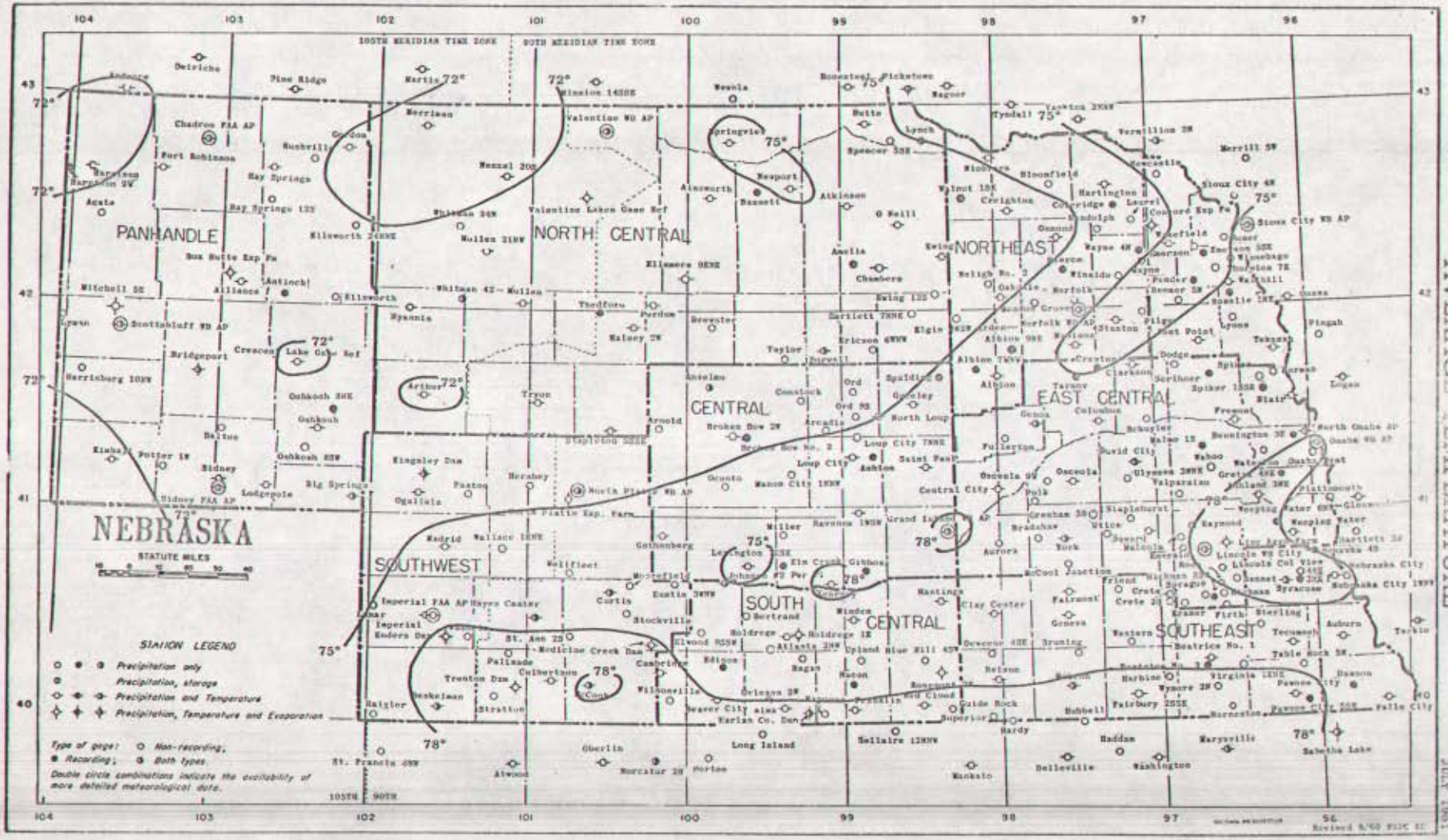
AVERAGE TEMPERATURE



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3N	Hickman [illegible]	Wartell 2NNW	Princeton	Princeton 2N	Roca 2SE
Crete 2SE	Hallam 2NNE	Hickman 1W	Wartell 5W	Princeton 2W	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1N	Hollen [illegible]	Pioneer 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF [illegible]IMATELY EQUAL VALUES.



AVERAGE TEMPERATURE

JULY 1961

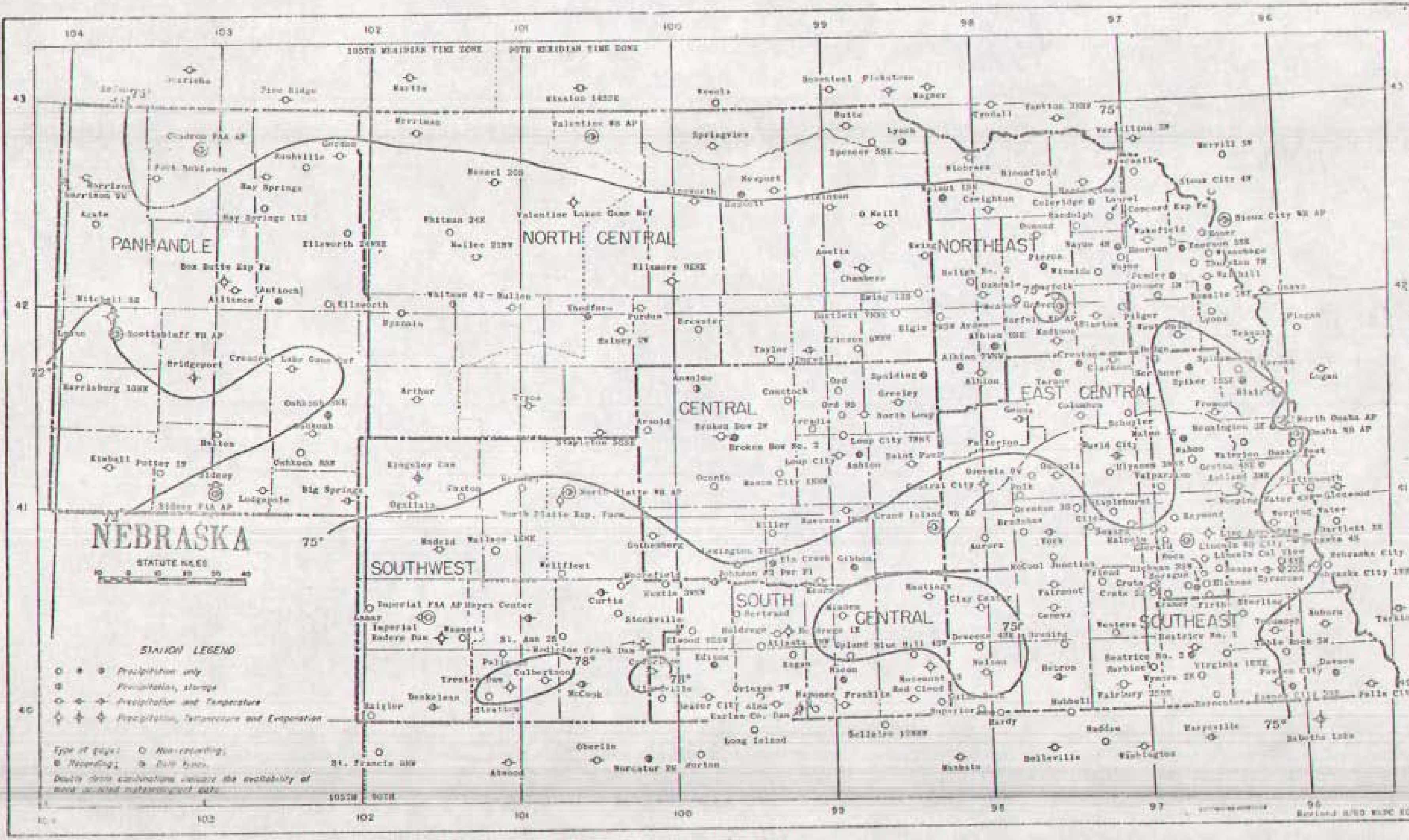
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW
Crete 3SE
Crete 7NE
Hallam 3W
Hallam 2NNE
Hickman 1W
Hickman 2WSW
Hickman 3W
Holland
Wartell 2NNW
Wartell 5W
Panama 2NW
Princeton
Princeton 2E
Princeton 2NW
Princeton 3W
Roca 2S
Roca 1NE
Roca 3SE
Roca 5NE
Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

AVERAGE TEMPERATURE

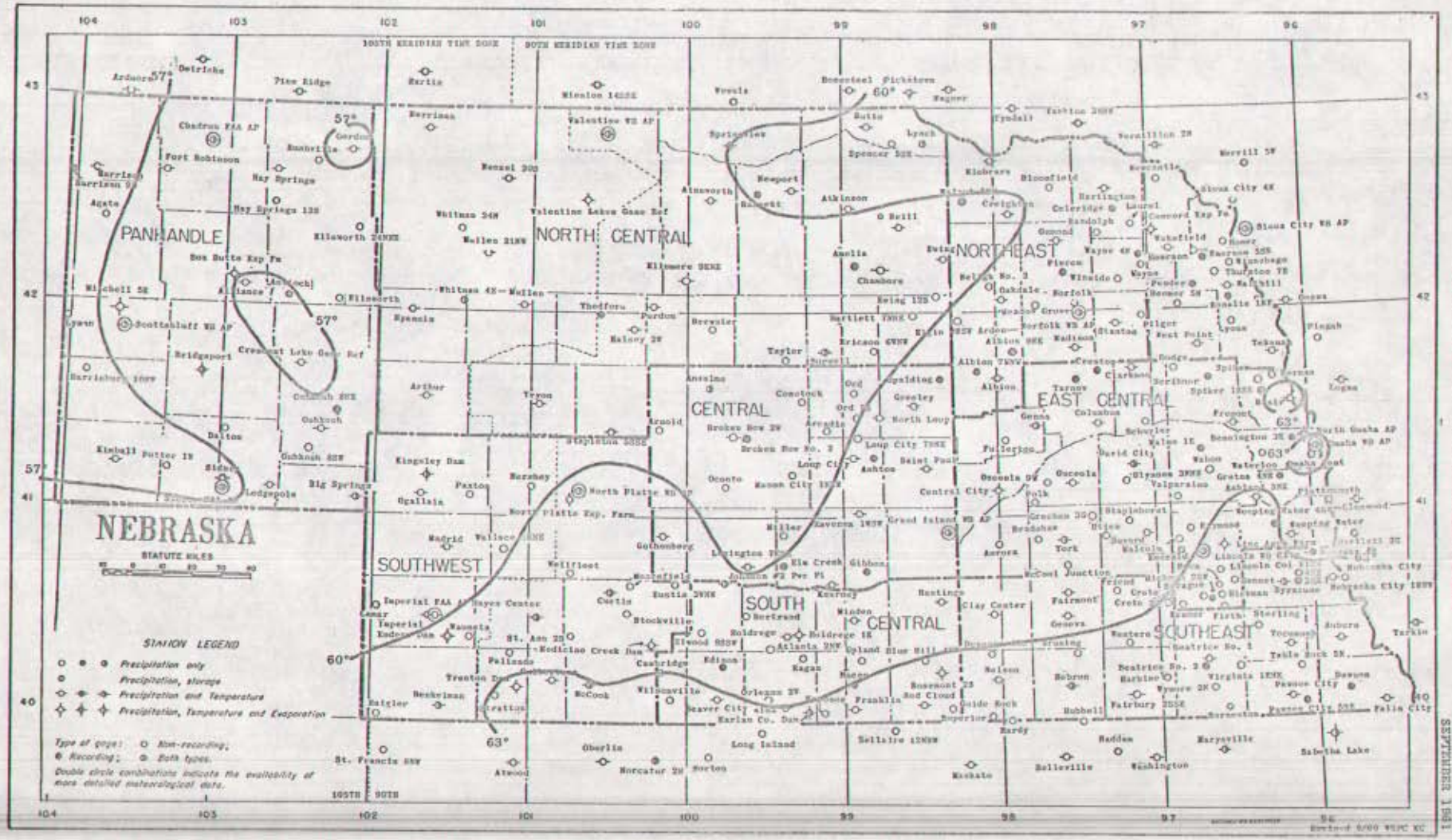
AUGUST 1961



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Crete 7SE	Hickman 1N	Hickman 2W	Pawnee 2SW	Princeton	Princeton 3S	Roca 2SE
		Hickman 3N	Martell 2SE	Princeton 2E	Roca 2S	Roca 5SE
		Holland		Princeton 3SW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.



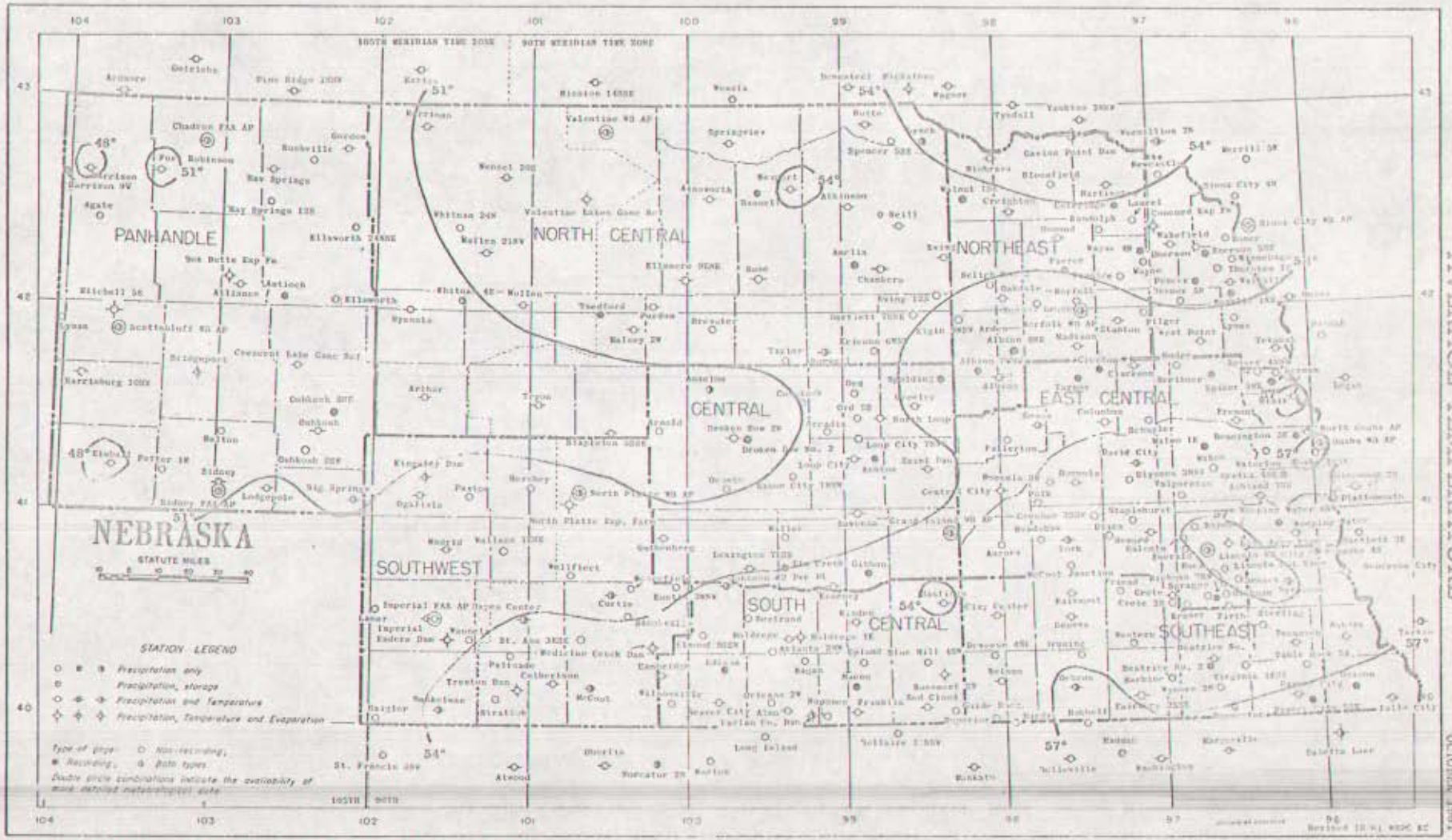
AVERAGE TEMPERATURE

SEPTEMBER 1961

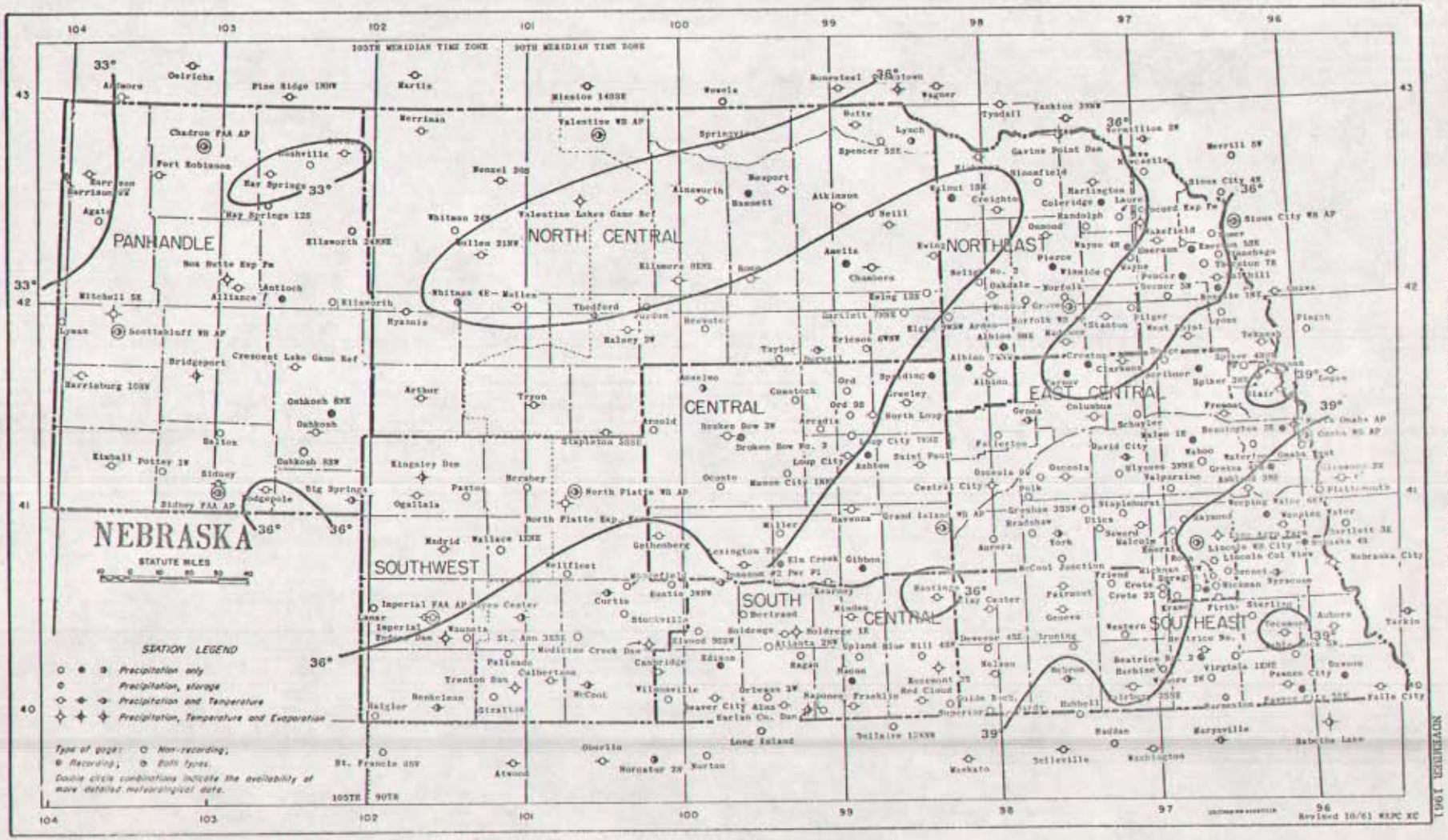
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2WSW	Princeton	Princeton 3W	Roca 2SE
Crete 3SE	Hallam 2WNW	Hickman 3W	Martell 5W	Princeton 2E	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

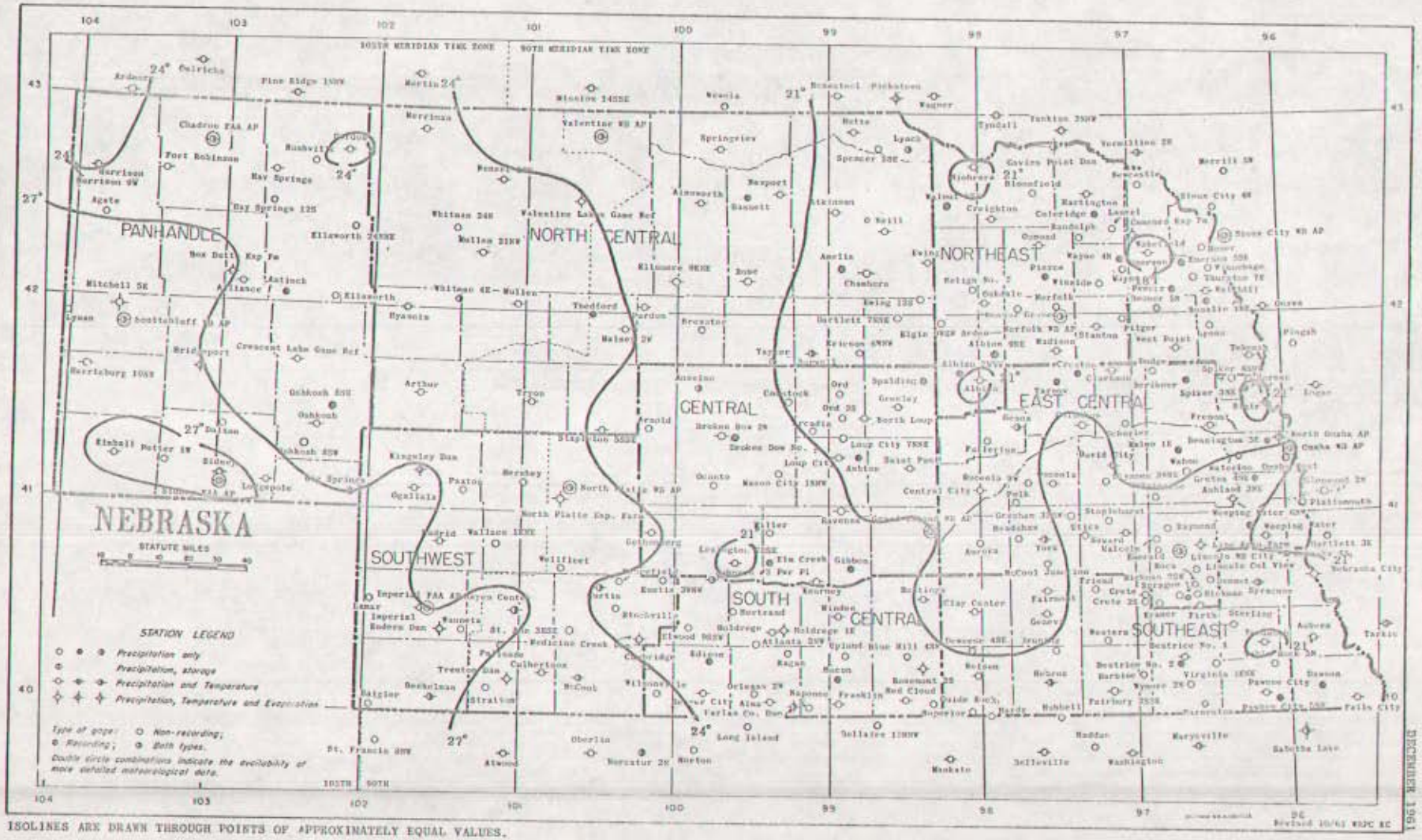
ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.



ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.



ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

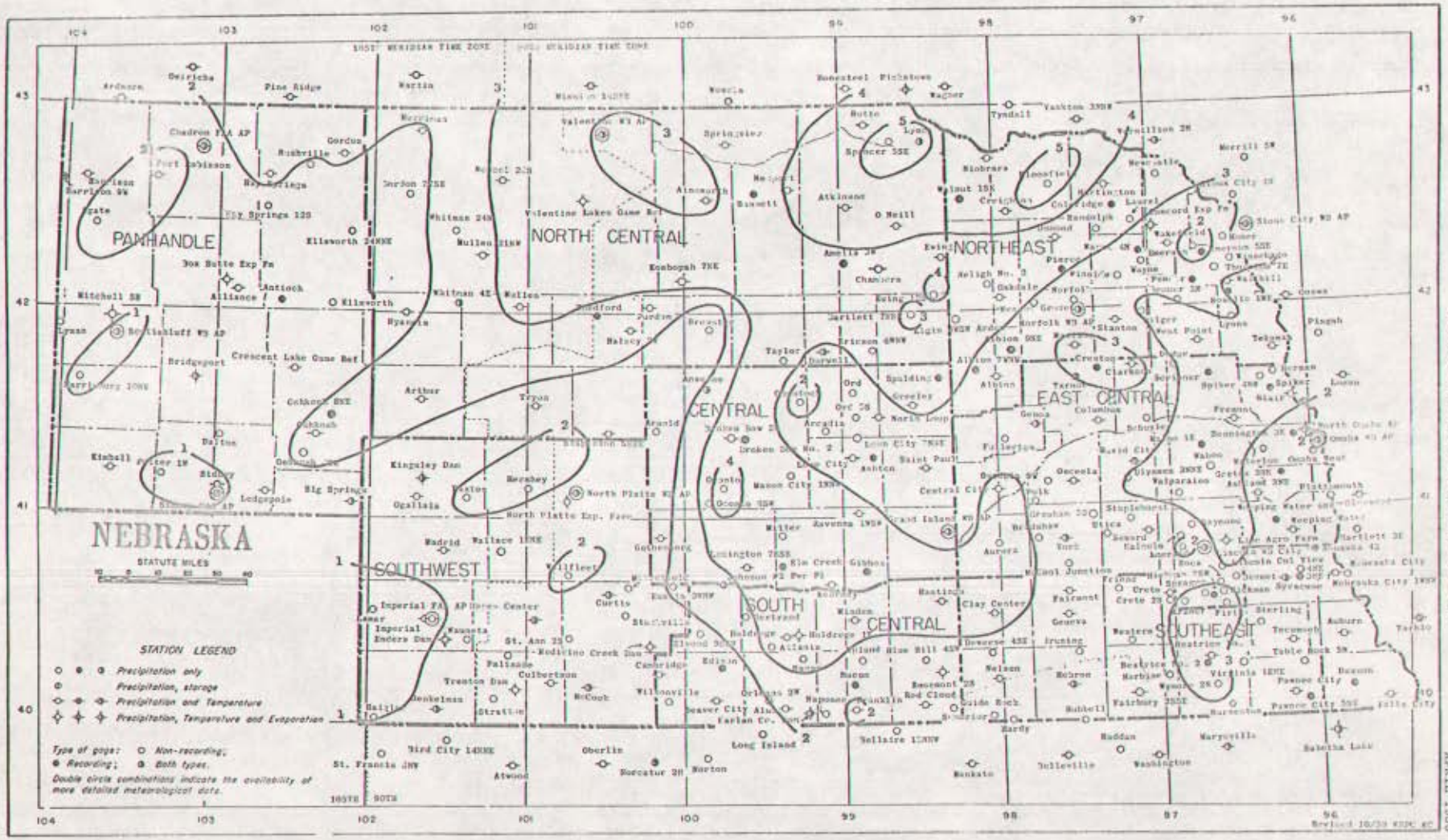


AVERAGE TEMPERATURE

DECEMBER 1961

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES.

TOTAL PRECIPITATION

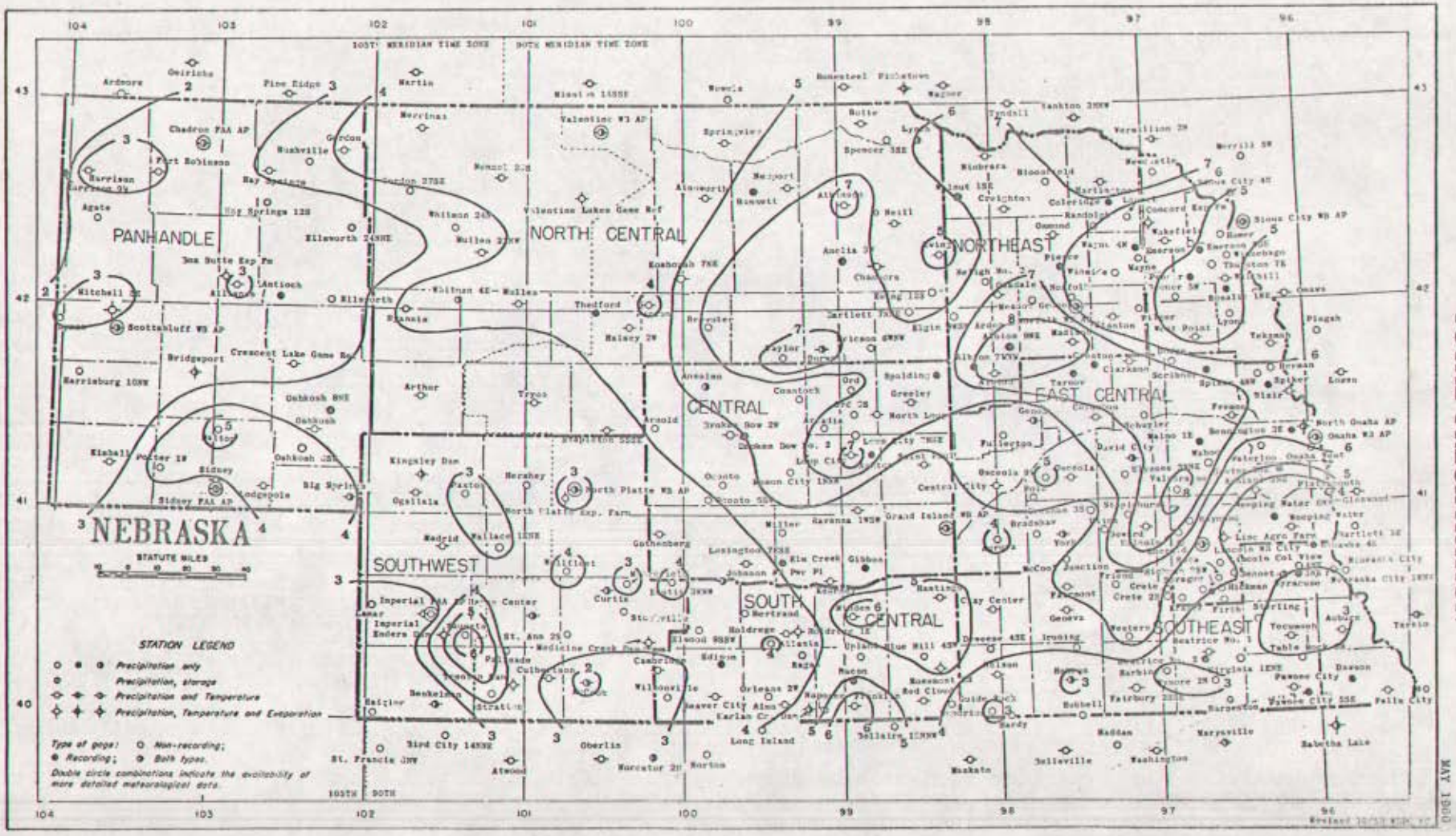


APRIL 1950

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2WSW	Princeton	Princeton 2E	Roca 2SE
Crete 3ESE	Hallam 2NNE	Hickman 3W	Martell 5W	Princeton 2S	Roca 2S	Roca 5SE
Crete 7NE	Hickman 1W	Holland	Panama 2NW	Princeton 2SW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



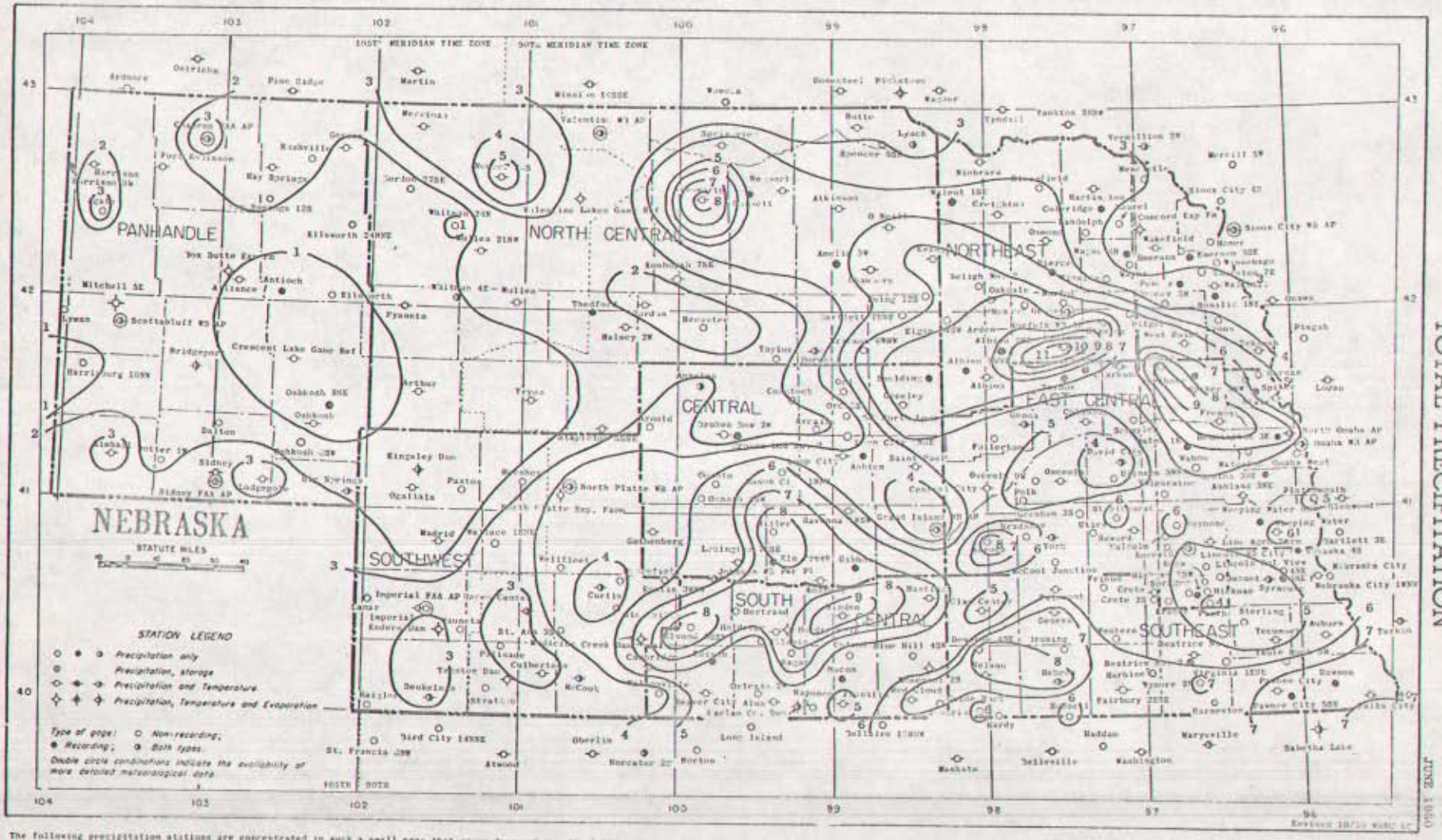
TOTAL PRECIPITATION

MAY 1960

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2NW	Princeton	Princeton 3W	Rock 2SE
Crete 2ESE	Hallam 2NNE	Hickman 3W	Martell 5W	Princeton 2W	Rock 2S	Rock 5NE
Crete 7SE	Hickman 1W	Holland	Panama 2SW	Princeton 2NW	Rock 1NE	Sprague 1ESE

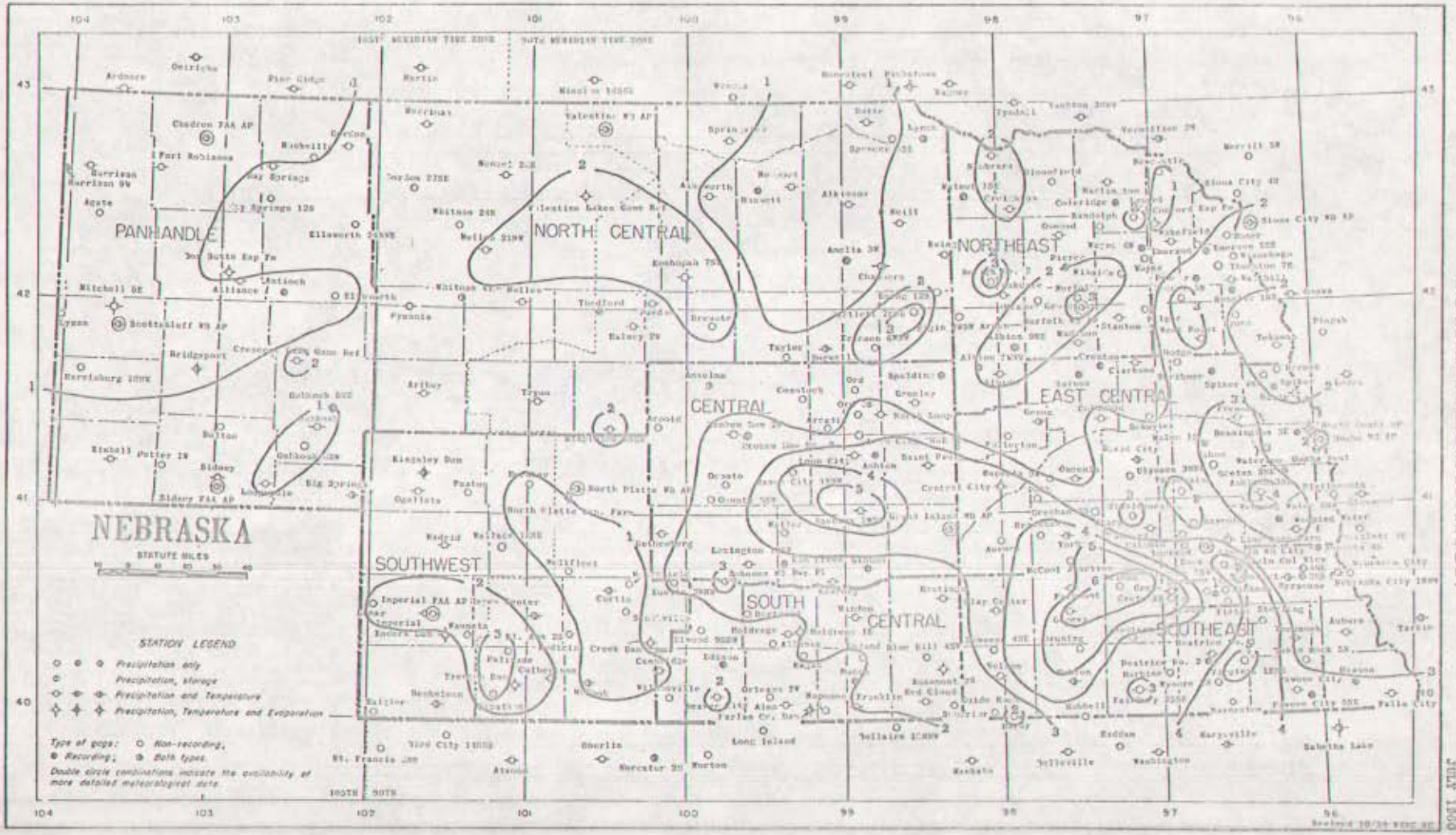
ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bayard 4SE, Crete 3ESE, Crete 7SE, Hallam 3W, Hallam 2SSE, Hickman 1S, Hickman 2WSW, Hickman 2E, Holland, Martell 2WSW, Martell 5W, Panama 2WW, Princeton, Princeton 2E, Princeton 2SW, Princeton 3W, Rock 2SE, Rock 2S, Rock 3NE, Syracuse 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



TOTAL PRECIPITATION

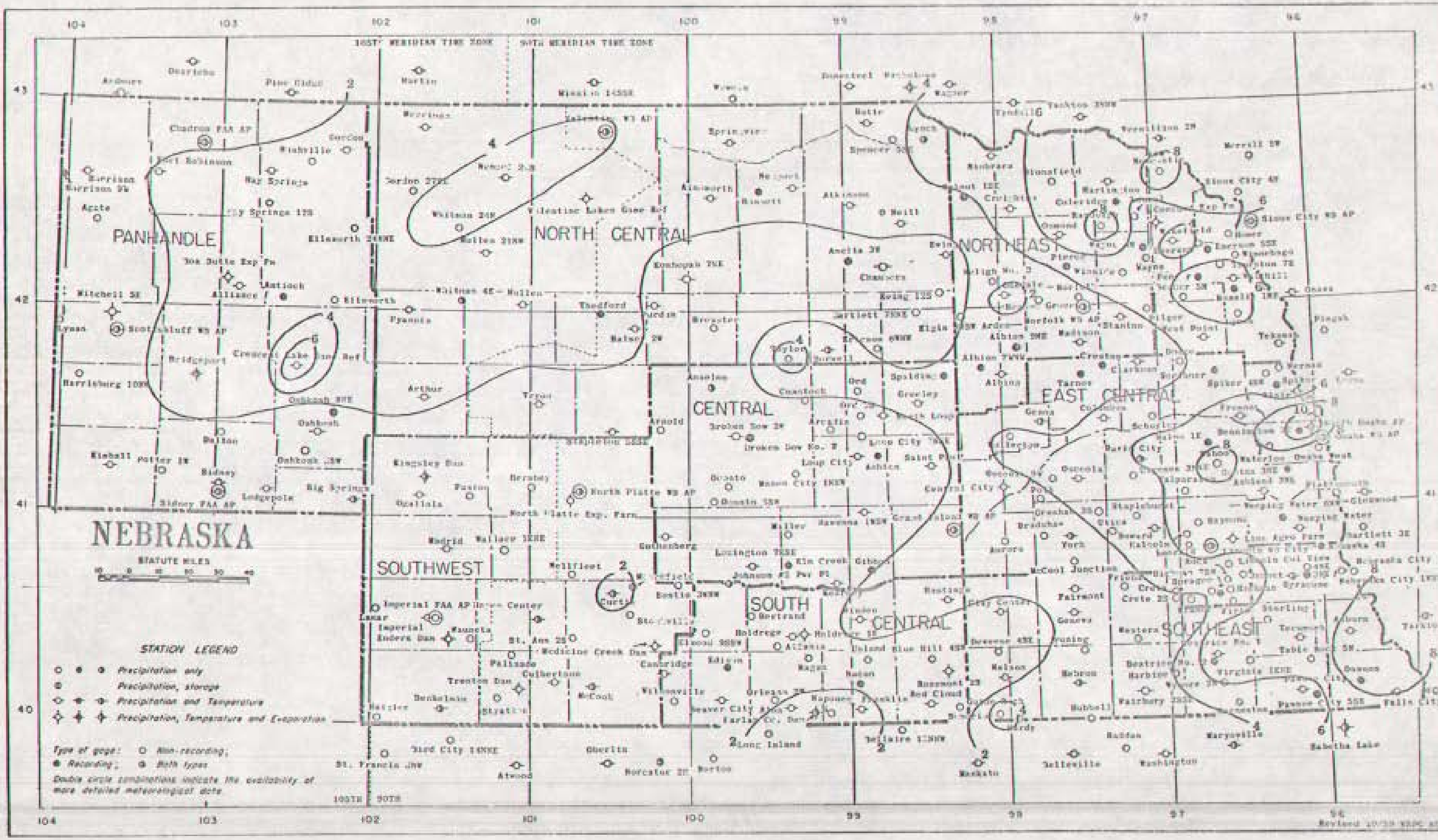
JULY 1969

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Fullon 3W	Hickman 2WSW	Martell 2WSW	Princeton	Princeton 3W	Rock 2SE
Crete 3ESE	Fullon 2WNW	Hickman 2W	Martell 5W	Princeton 2W	Rock 2S	Rock 5WE
Crete 2NE	Kinkaid 1W	Holland	Pleasant 2NW	Princeton 2WW	Rock 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

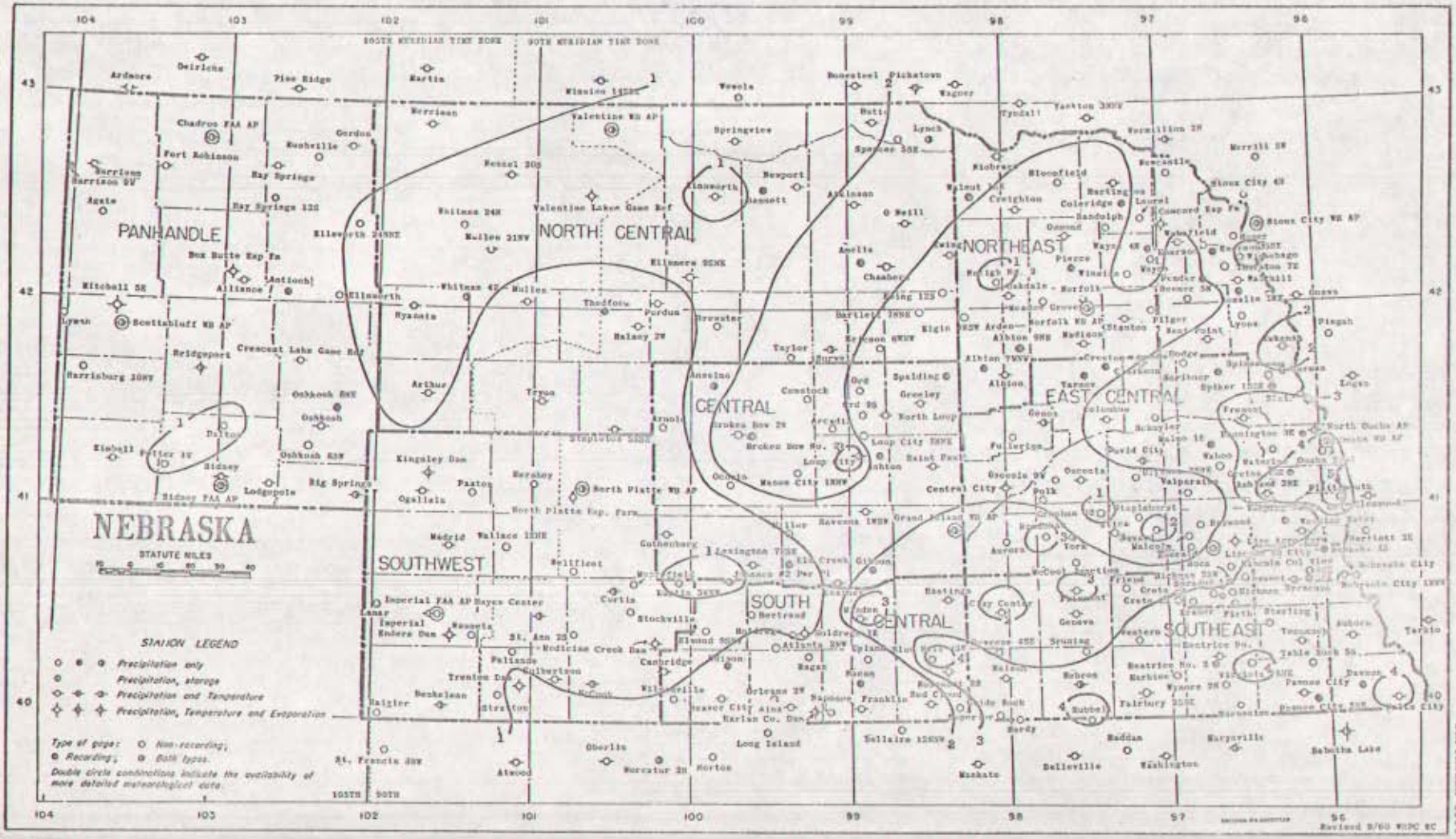
TOTAL PRECIPITATION



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 2W	Hickman 2NNW	Martell 2NNW	Princeton	Princeton 3E	Roca 3SE
Crete 3ESE	Hallam 2NNE	Hickman 3W	Martell 5W	Princeton 3W	Roca 2S	Roca 5NE
Crete 7SE	Hickman 1E	Holland	Panama 2SW	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



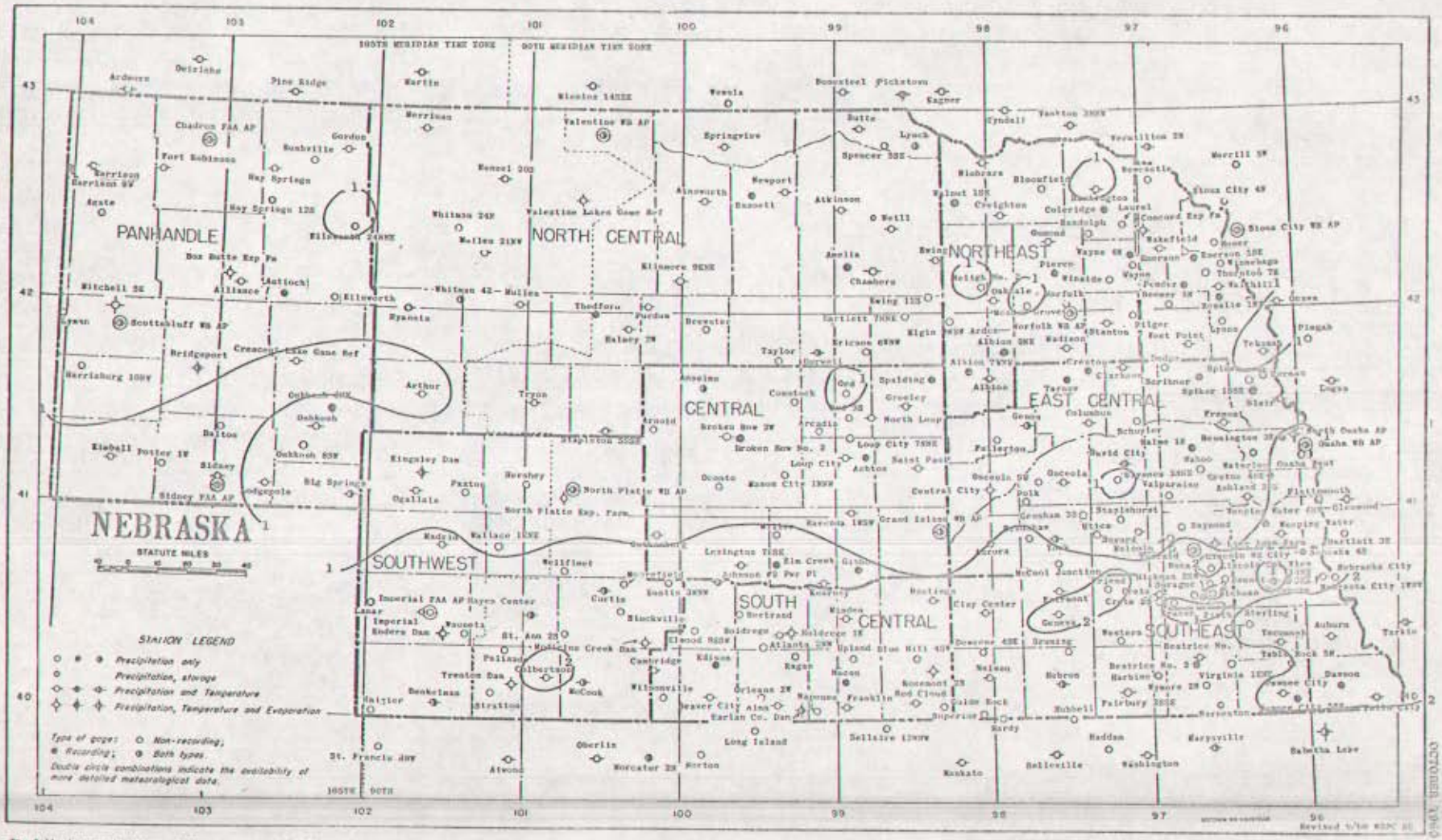
TOTAL PRECIPITATION

SEPTEMBER 1960

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2WNW	Princeton	Princeton 3N	Roca 2NE
Crete 3SE	Hallam 3SSE	Hickman 3W	Martell 5W	Princeton 2W	Roca 3S	Roca 5NE
Crete 7SE	Hickman 1E	Holland	Panama 2NE	Princeton 3NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



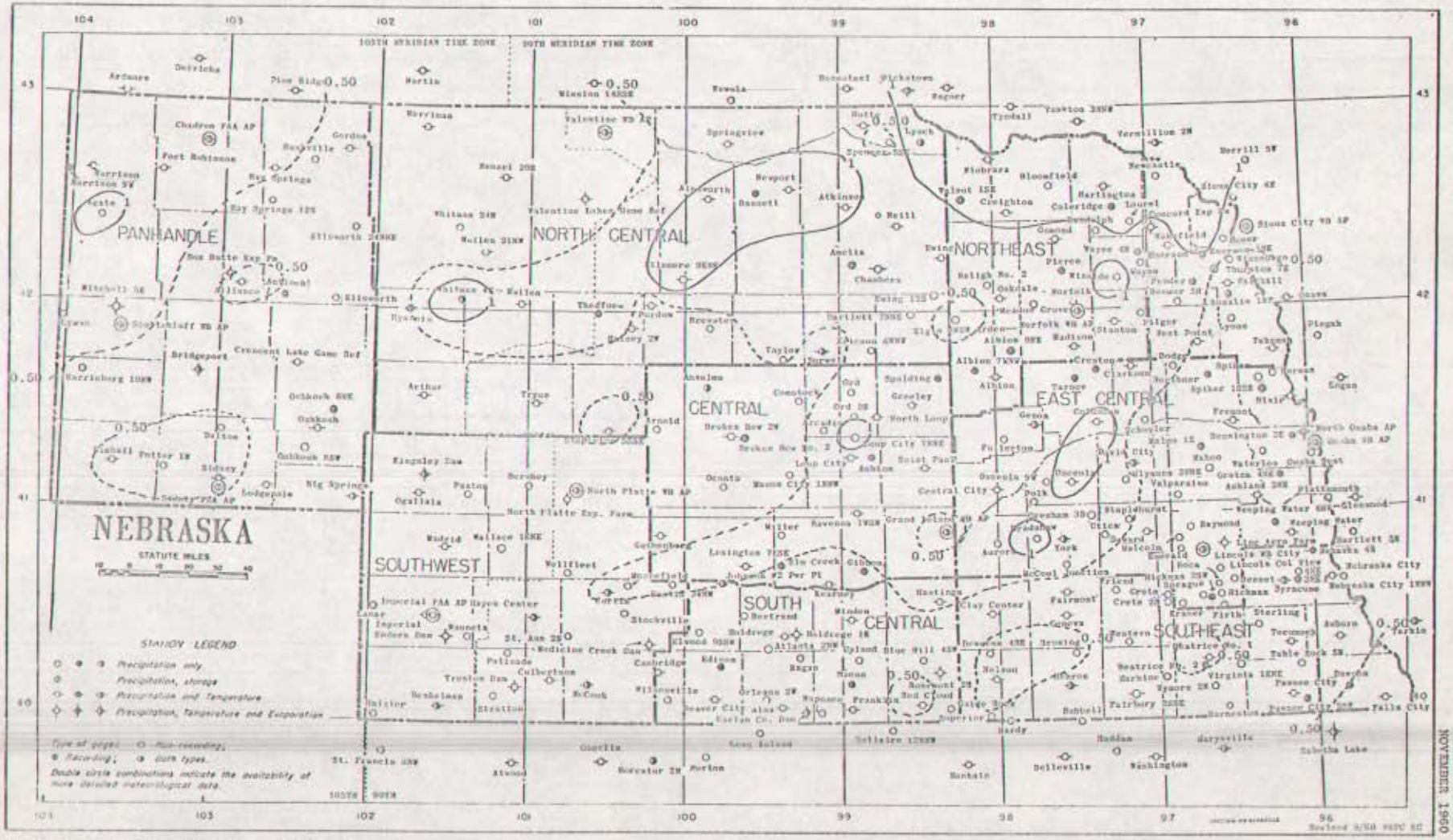
TOTAL PRECIPITATION

OCTOBER 1965

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW
Crete 2SE
Crete 7NE
Hallam 3W
Hallam 2WNW
Hickman 2WSW
Hickman 3W
Holland
Martell 2NNW
Martell 5W
Panama 2NW
Princeton
Princeton 2E
Princeton 2NW
Rock 2E
Rock 1NE
Rock 2SE
Rock 5NE
Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



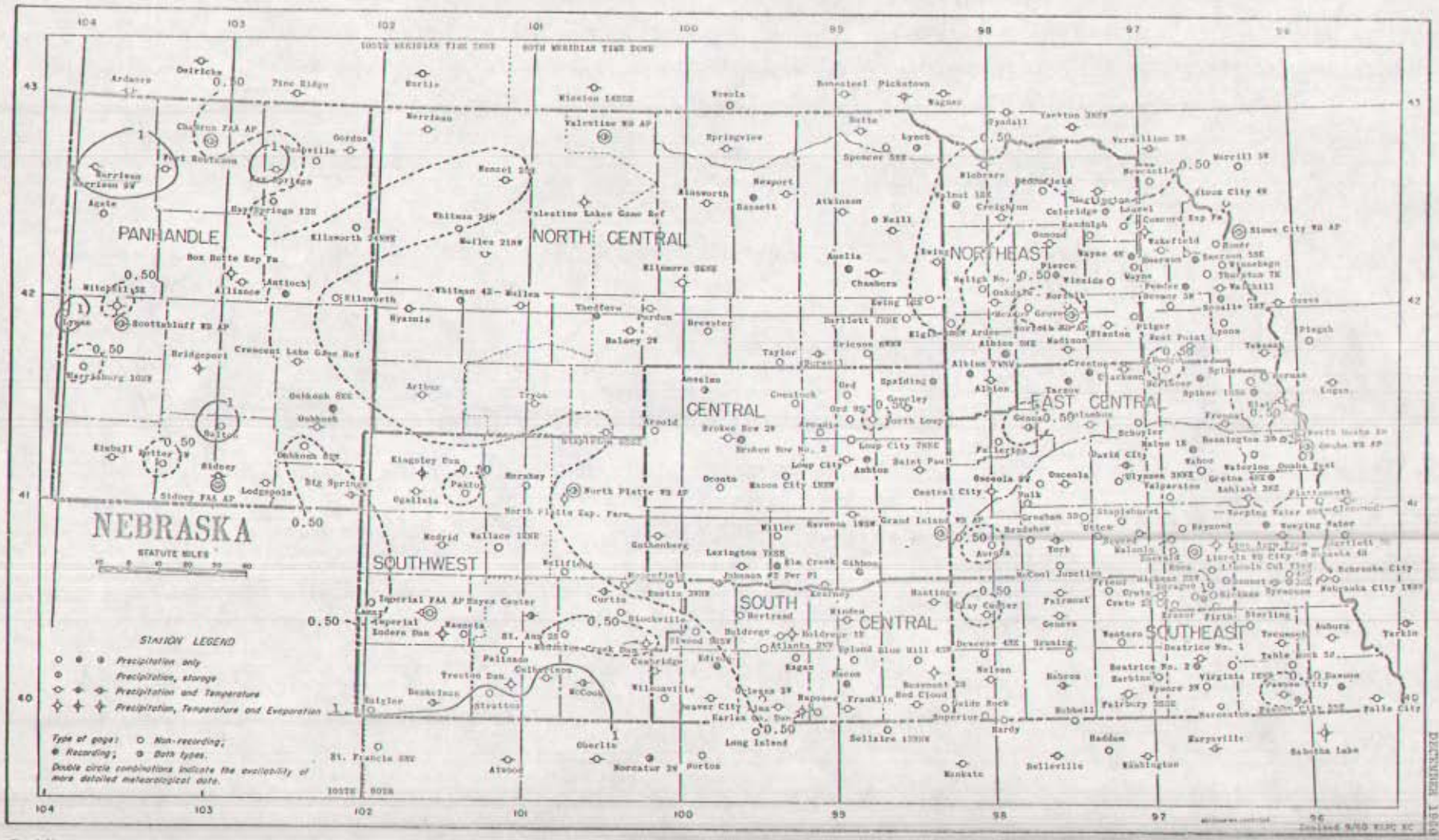
TOTAL PRECIPITATION

NOVEMBER 1960

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW, Crete 2SE, Crete 7SE, Hallam 2W, Hallam 10SE, Hickman 1W, Hickman 2NW, Hickman 3W, Holland, Hartwell 2NW, Hartwell 5W, Panama 2NW, Princeton, Princeton 2E, Princeton 3NW, Princeton 3W, Roca 2S, Roca 10E, Roca 2SE, Roca 5SE, Sprague 1SSE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



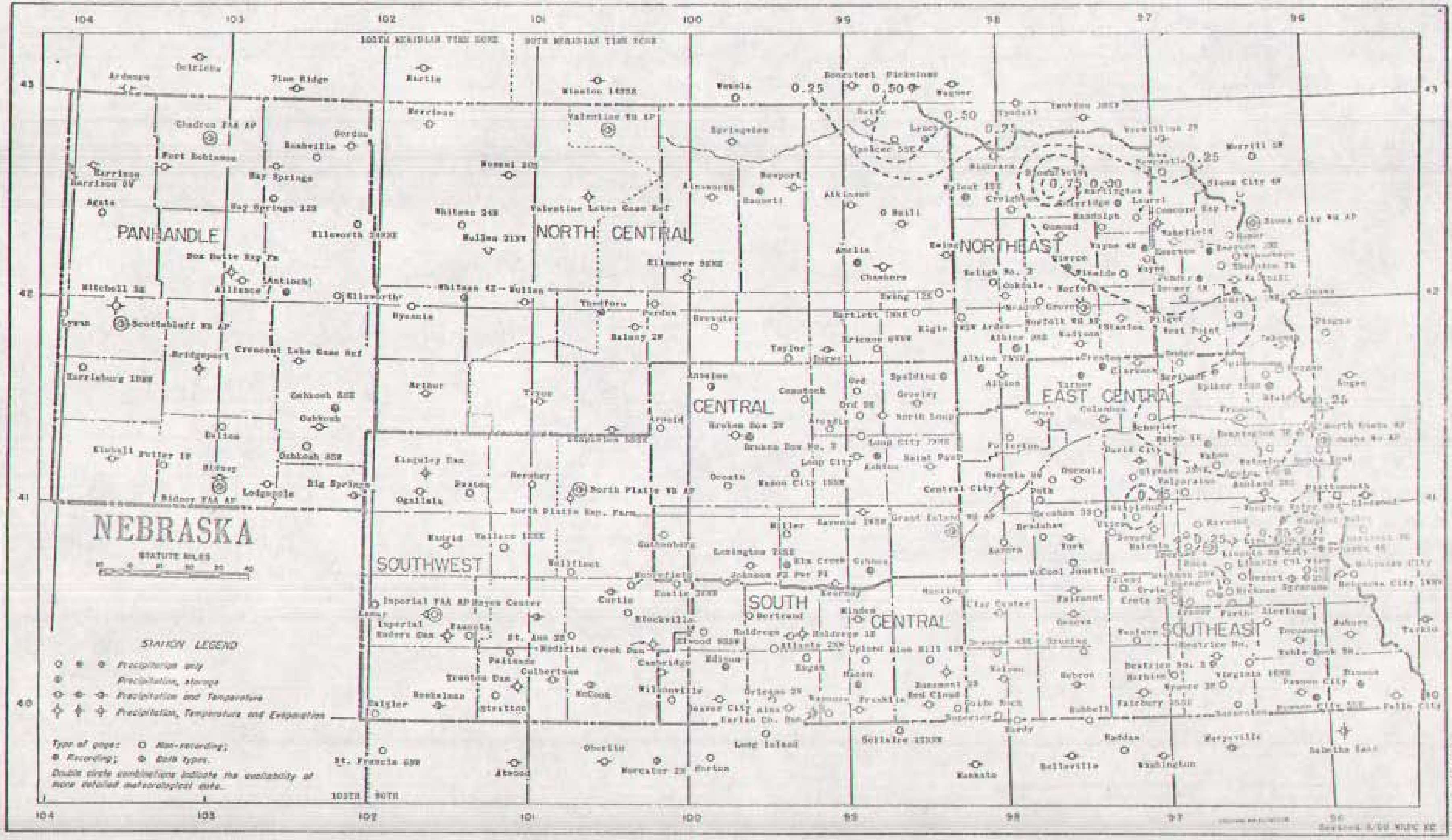
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2SSW	Martell 2NNE	Princeton	Princeton 3N	Roca 2SE
Crete 3SE	Hallam 2NNE	Hickman 3E	Martell 5W	Princeton 2E	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1E	Holland	Panama 3SW	Princeton 2NW	Roca 1NE	Sprague 8SE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

TOTAL PRECIPITATION

JANUARY 1961



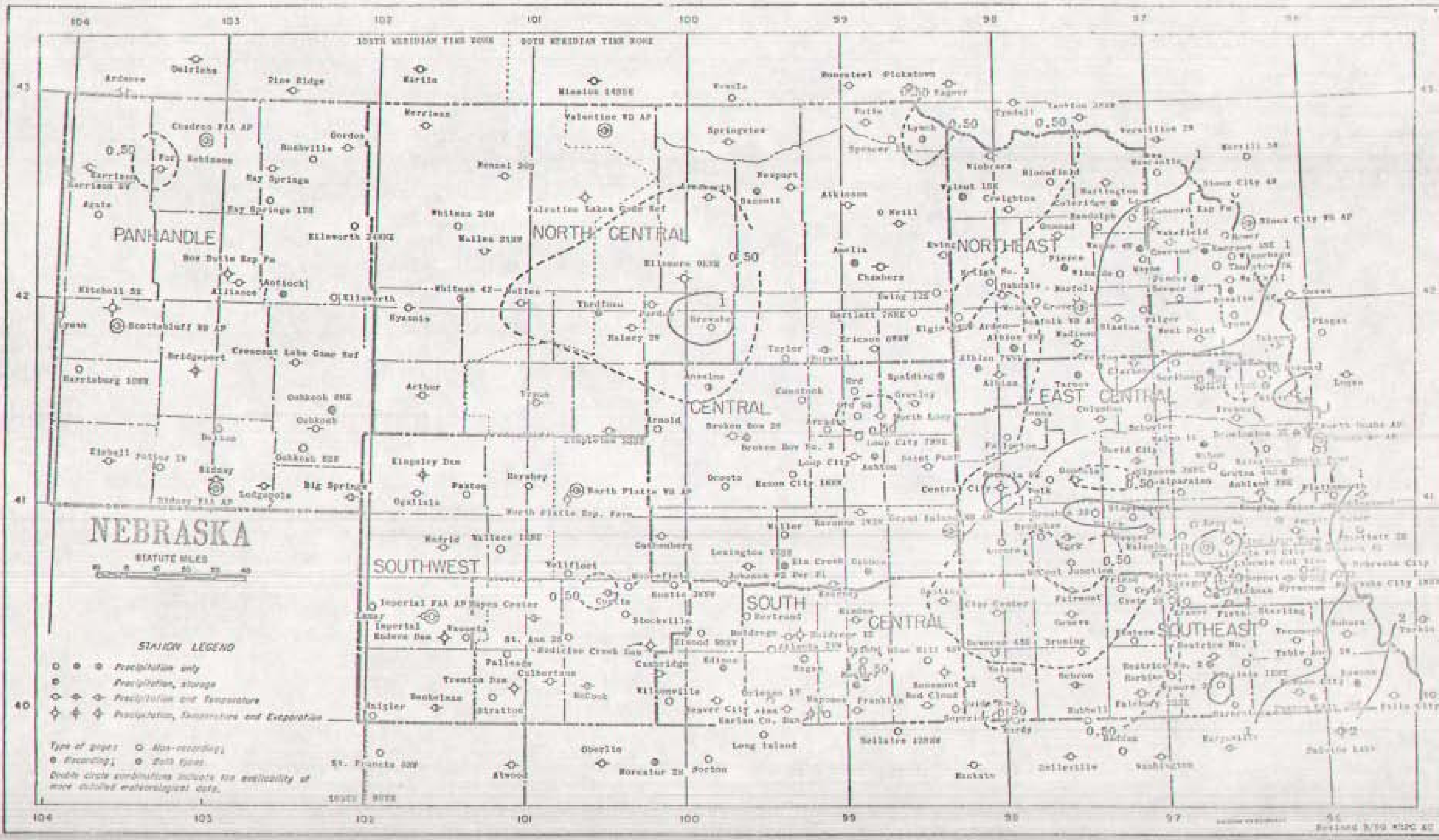
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 1NW	Martell 2NNW	Princeton	Princeton 3W	Roca 2SE
Crete 3SE	Hallam 3NNE	Hickman 3N	Martell 5W	Princeton 3E	Roca 3E	Roca 2NE
Crete 7SE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

TOTAL PRECIPITATION

FEBRUARY 1961

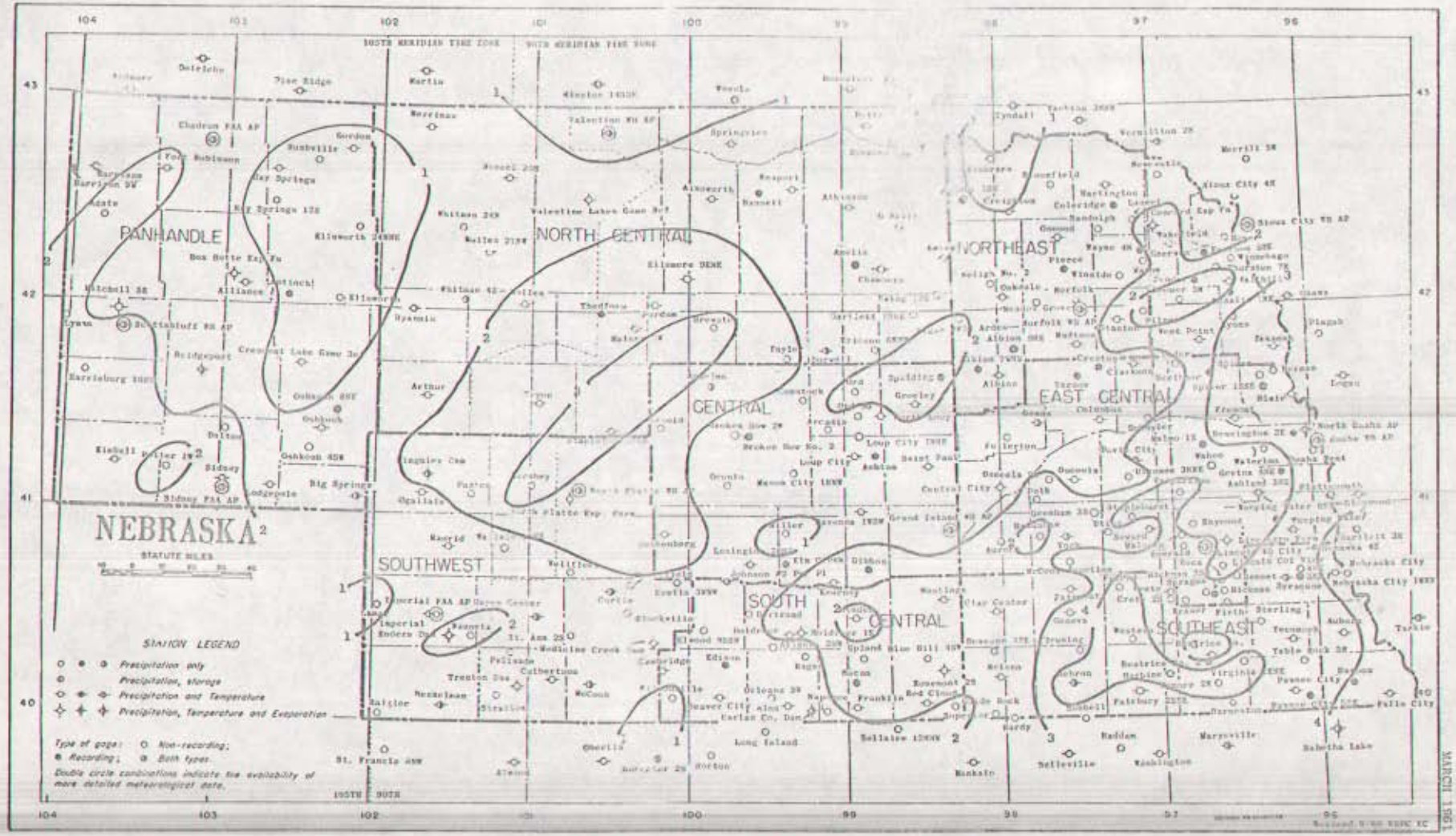


The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2NSW	Princeton	Princeton 3S	Roca 3SE
Crete 3NE	Hallam 2NNE	Hickman 3W	Martell 3W	Princeton 2N	Roca 2S	Roca 3NE
Crete 7NE	Hickman 1W	Holland	Panama 2SW	Princeton 3SW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

TOTAL PRECIPITATION



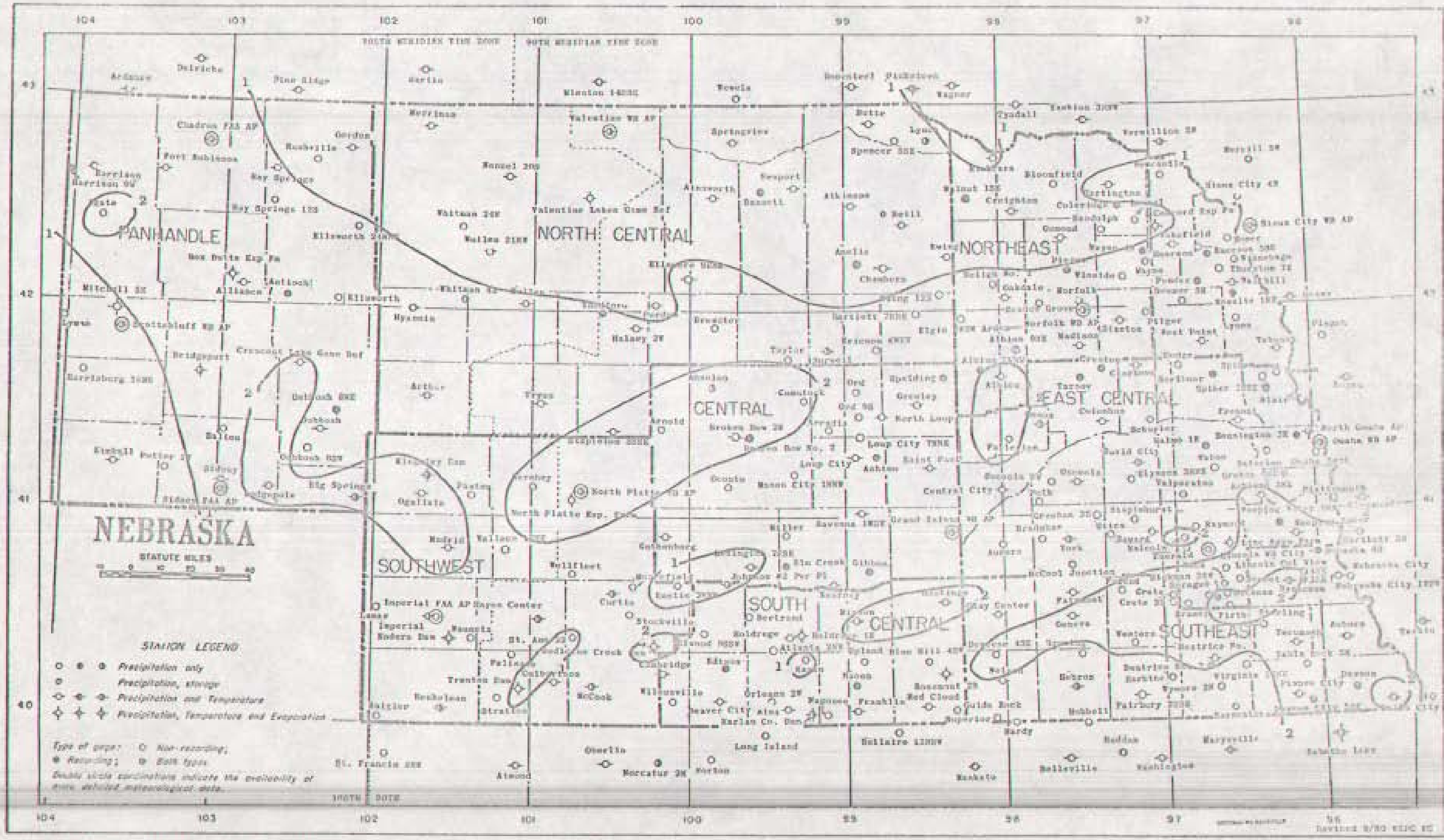
MARCH 1961

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2WSW	Princeton	Princeton 2W	Rock 2SE
Crete 3SE	Hallam 2NNE	Hickman 2W	Martell 5W	Princeton 3W	Roca 2S	Rock 5NE
Crete 7NE	Hickman 1E	Holland	Panama 2NW	Princeton 5NW	Roca 1NE	Sprague 1ENE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

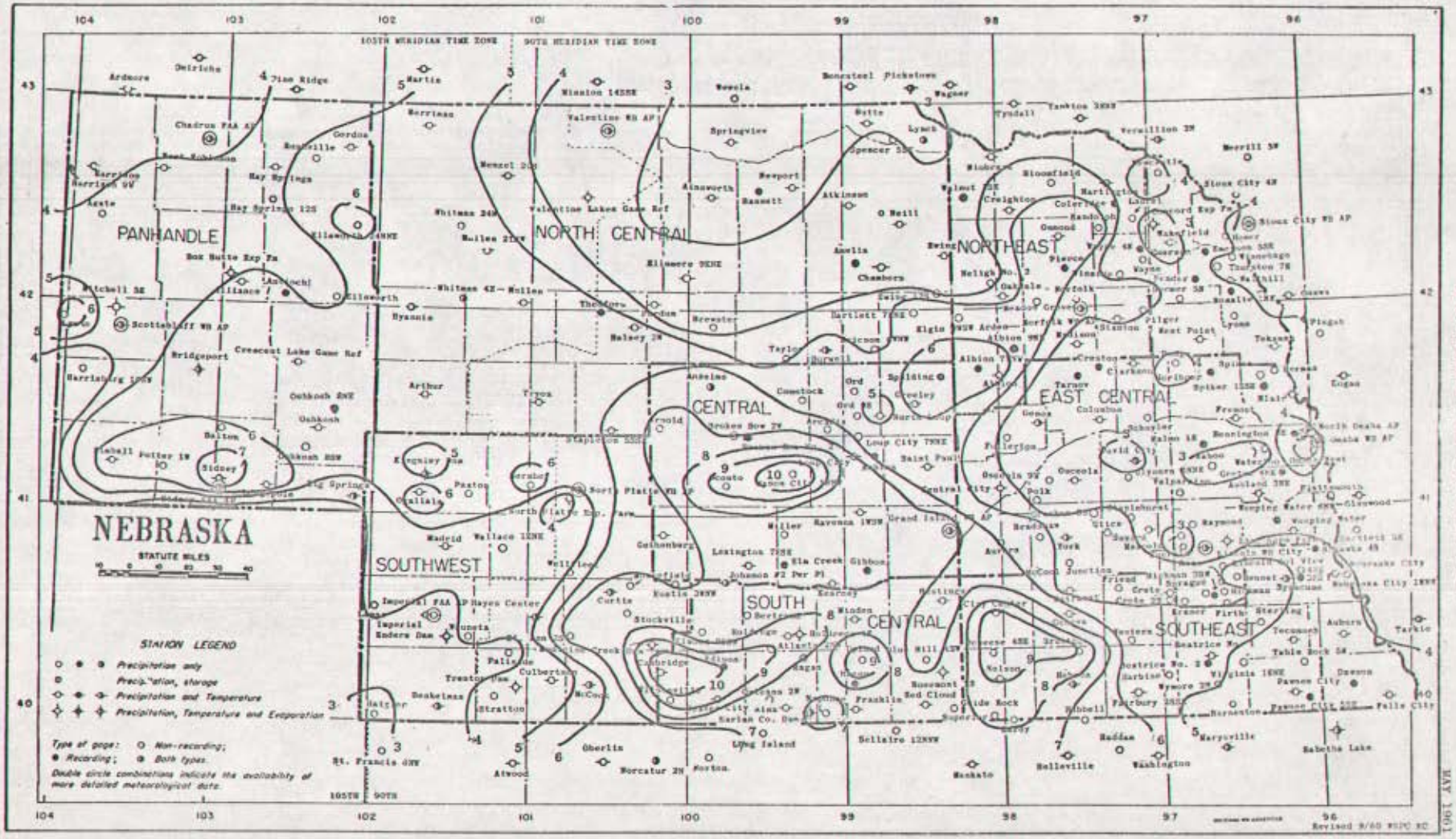
TOTAL PRECIPITATION



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4NE	Hallam 3W	Hickman 2NW	Martell 2NNW	Princeton	Princeton 2E	Roca 5SE
Crete 3SE	Hallam 2NNE	Hickman 3W	Martell 5W	Princeton 2W	Roca 2W	Roca 3NE
Crete 7NE	Hickman 1S	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



TOTAL PRECIPITATION

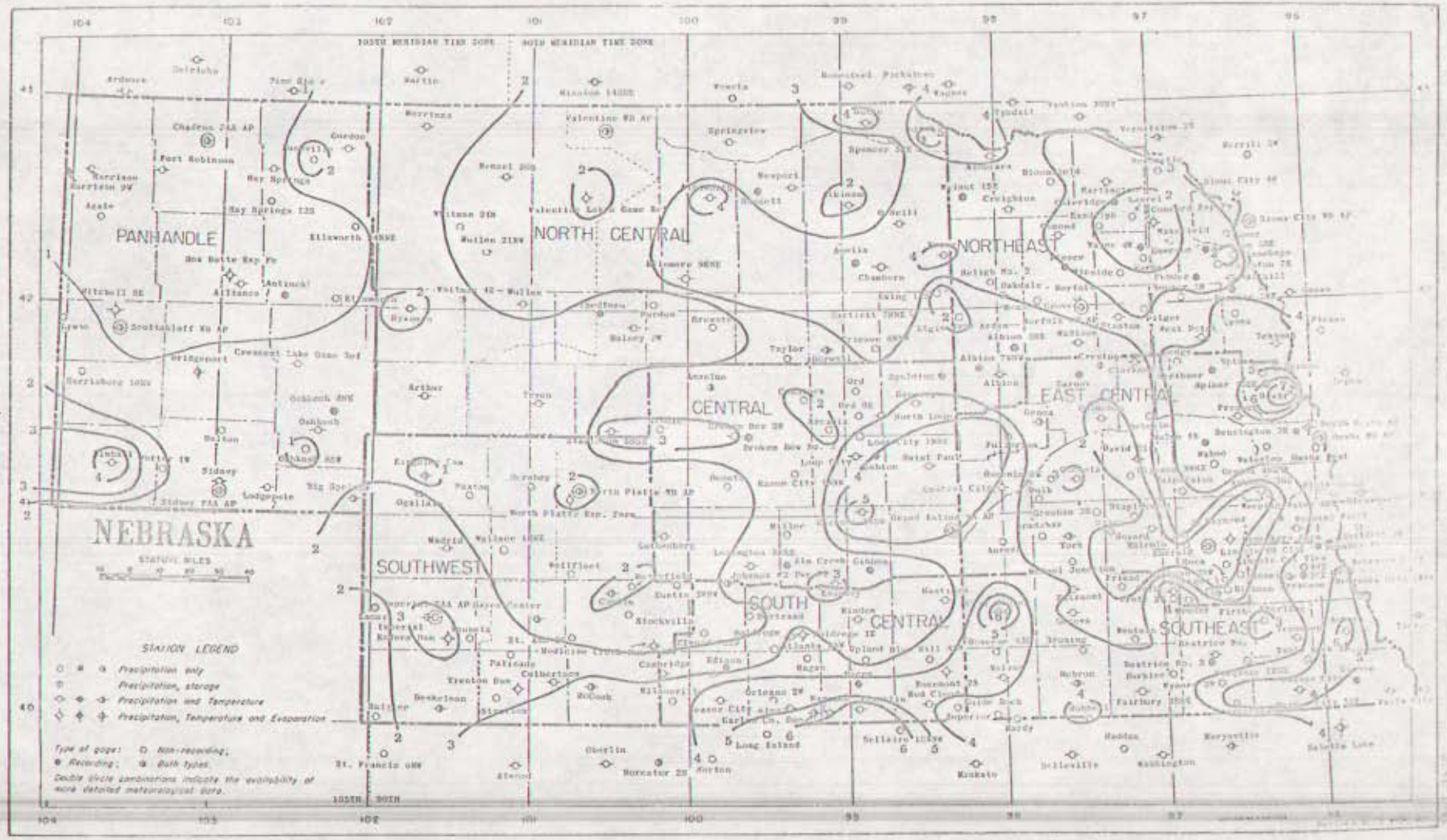
MAY 1961

Revised 8/60 WBPC RC

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3E	Hickman 2WSW	Martell 2WNW	Princeton	Princeton 3E	Roca 2SE
Crete 2SE	Hallam 2WSE	Hickman 3W	Martell 5W	Princeton 2E	Roca 2E	Roca 5NE
Crete 7NE	Hickman 1W	Holland	Panama 2WN	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

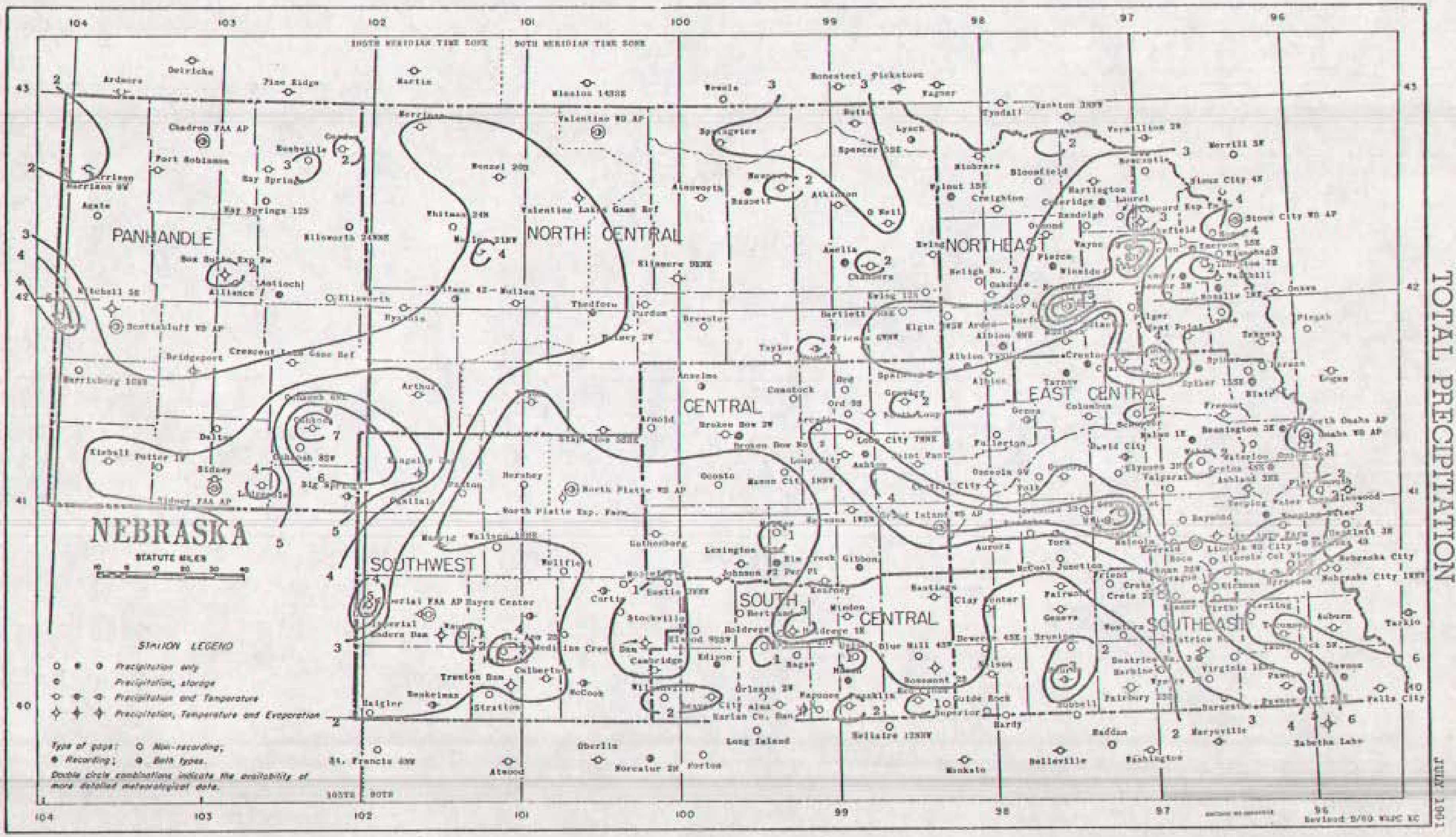


TOTAL PRECIPITATION

The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 5W	Hickman 2WSW	Martell 2NNW	Princeton	Princeton 3W	Roca 2SE
Crete 3SE	Hallam 2NNE	Hickman 3W	Martell 5W	Princeton 2W	Roca 2E	Roca 5NE
Crete 1NE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ESE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

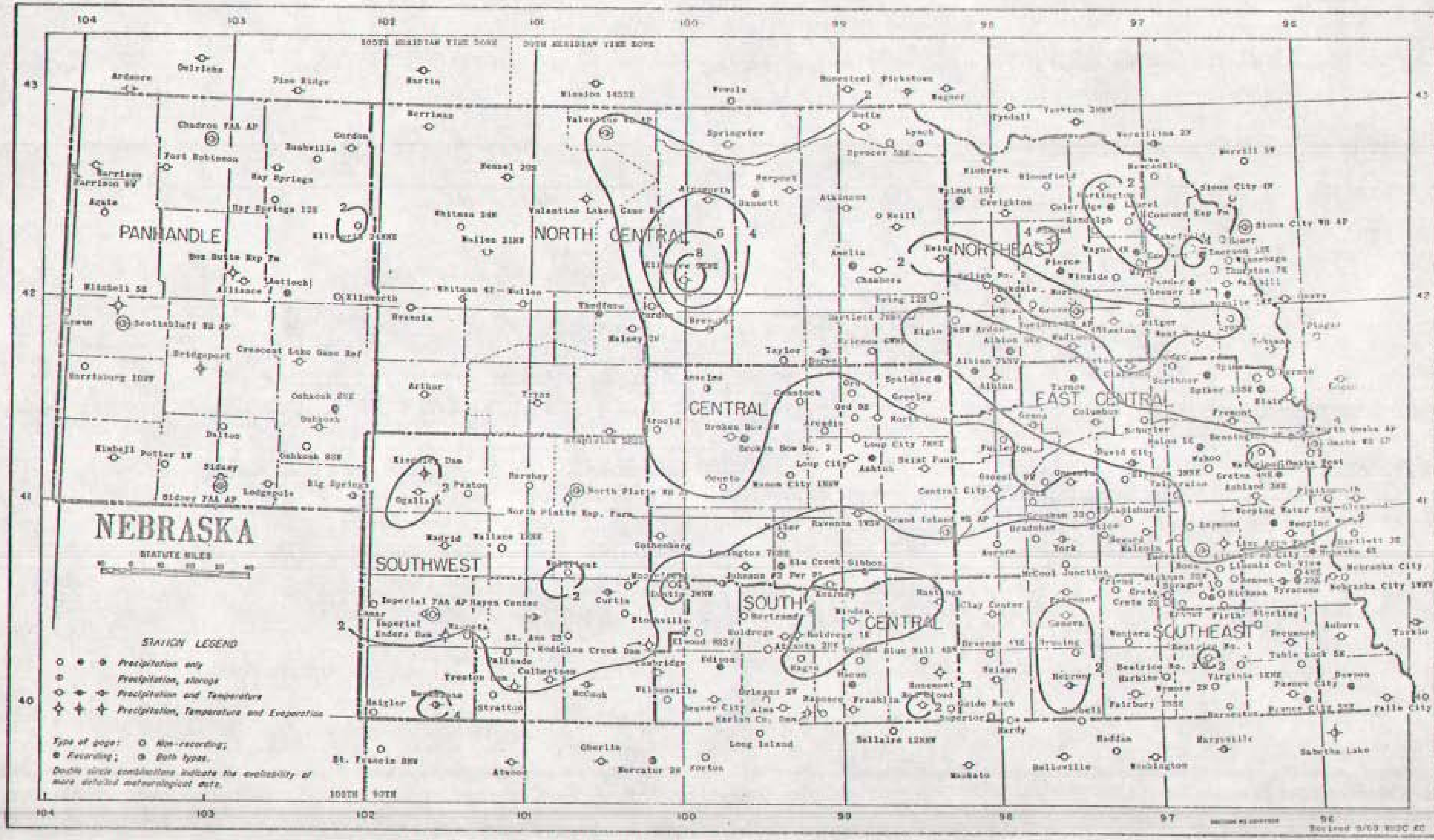


The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2NNW	Martell 3NNW	Princeton	Princeton 3S	Roca 2SE
Crete 3SE	Hallam 2NNW	Hickman 3W	Martell 3W	Princeton 2N	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1SE	Sprague 1NNE

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

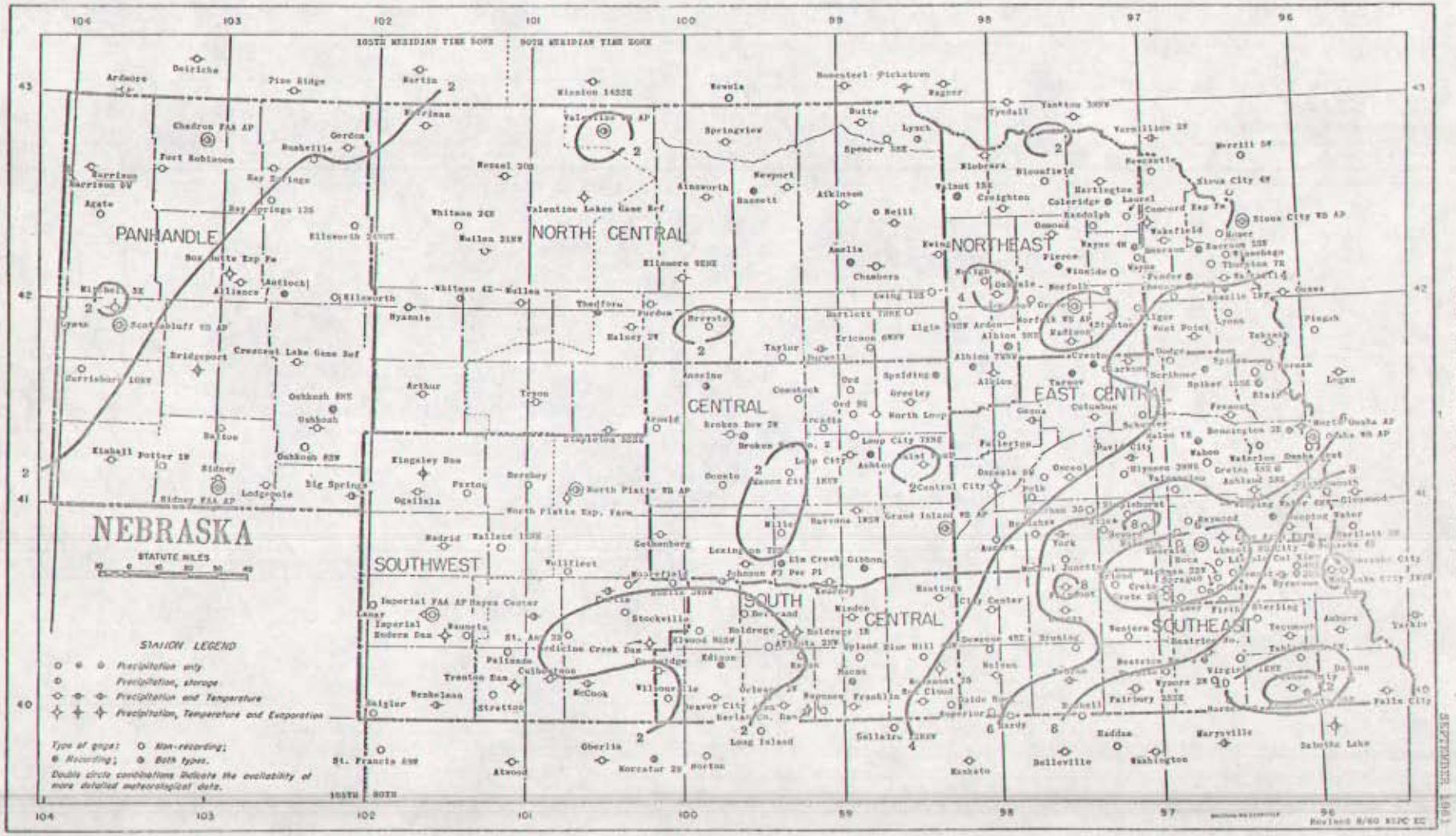
TOTAL PRECIPITATION



The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Bennet 4SW	Hallam 3W	Hickman 2WSW	Martell 2NNW	Princeton	Princeton 3N	Roca 2SE
Crete 3SE	Hallam 2NNE	Hickman 3W	Martell 3W	Princeton 2N	Roca 2S	Roca 3NE
Crete 7NE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1ENE

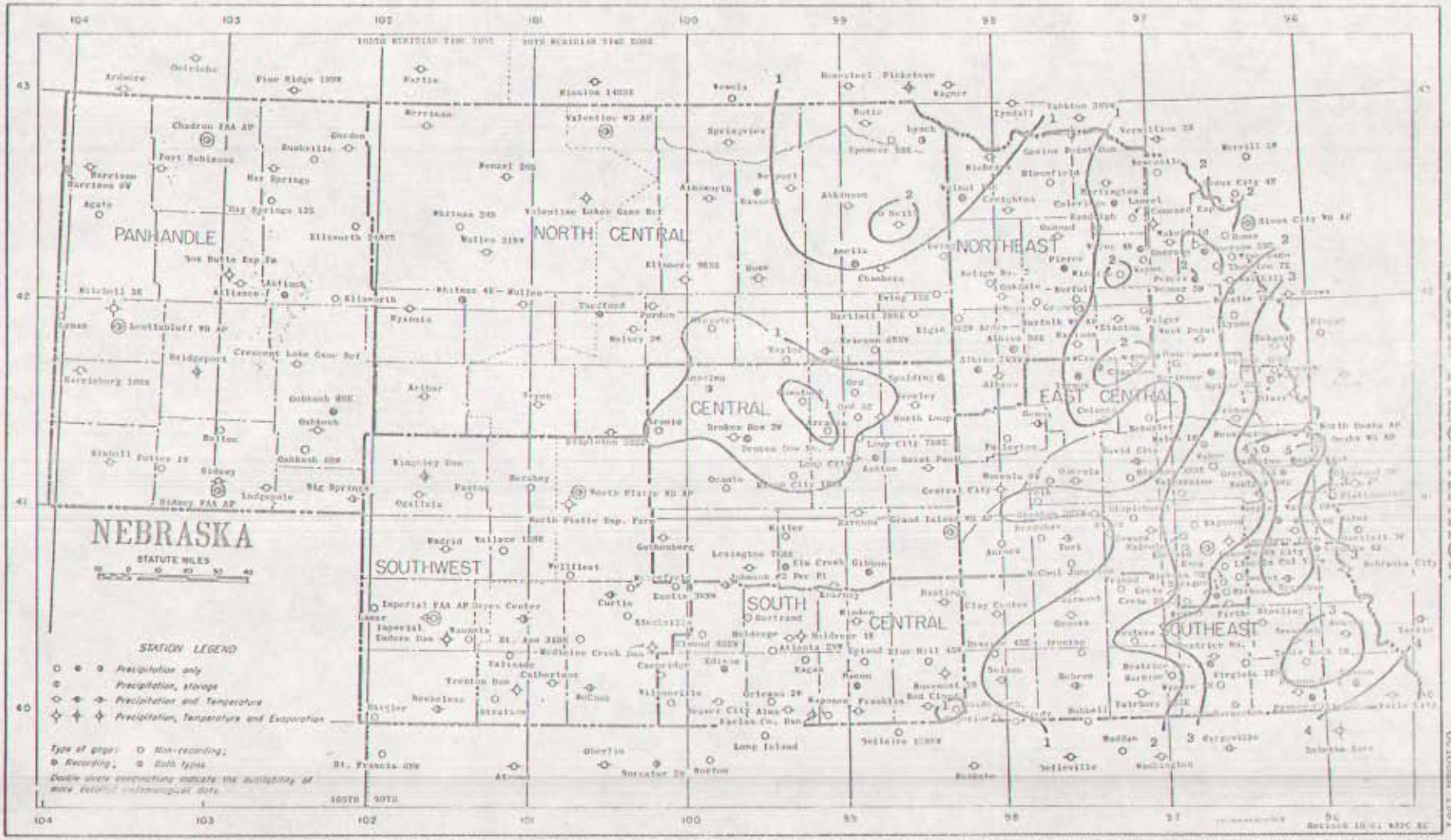
ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



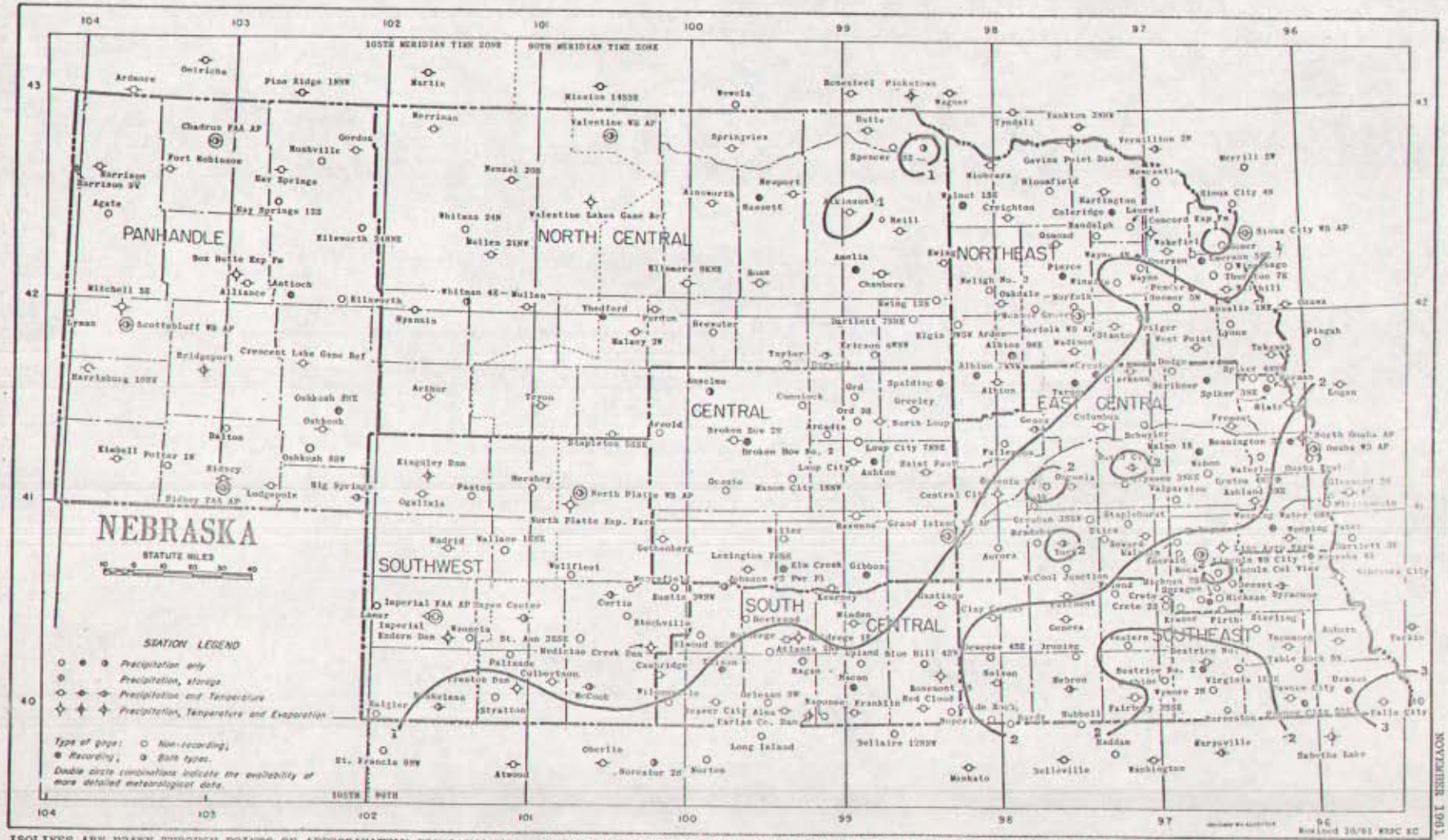
The following precipitation stations are concentrated in such a small area that space does not permit plotting them on the map. Please refer to Station Index for location.

Brunst 4SW	Hallam 3W	Hickman 2NNW	Martell 2NNW	Princeton	Princeton 3W	Roca 2SE
Crete 2SE	Hallam 2ENE	Hickman 2W	Martell 1W	Princeton 2W	Roca 2S	Roca 5NE
Crete 7NE	Hickman 1E	Holland	Panama 2NW	Princeton 2NW	Roca 1NE	Sprague 1NW

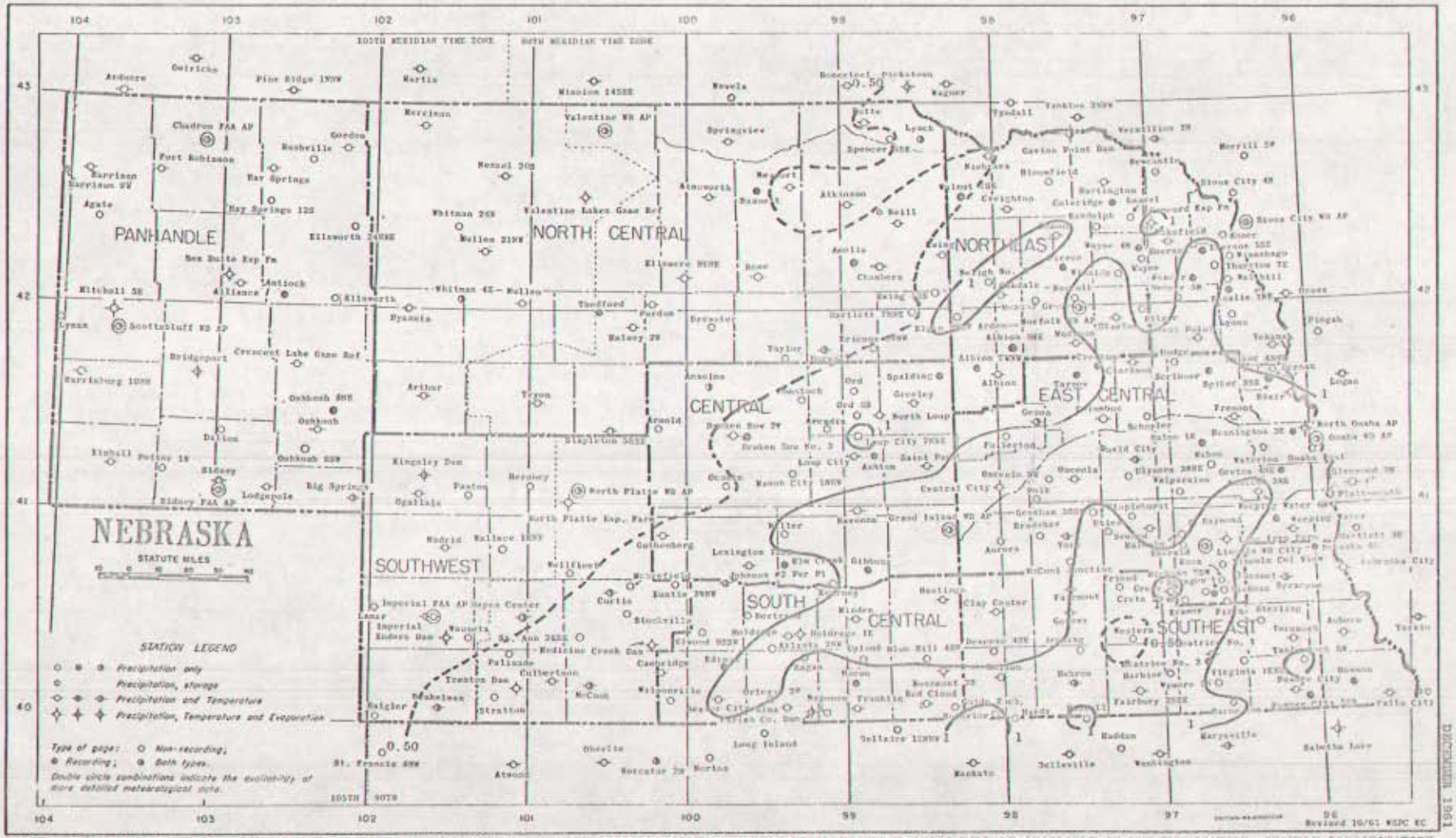
ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."



TOTAL PRECIPITATION

DECEMBER 1961

ISOLINES ARE DRAWN THROUGH POINTS OF APPROXIMATELY EQUAL VALUES. HOURLY PRECIPITATION DATA FROM RECORDER SUBSTATIONS WILL BE AVAILABLE IN THE PUBLICATION "HOURLY PRECIPITATION DATA."

RESUME AND RESULTS OF
FINAL NEGOTIATIONS ON CONTRACT
WITH WESTERN CONTRACTING CORPORATION

1. By letter dated 5 September 1961 the Contractor submitted a proposal of $29,839,441.24 for:

a. All changes required under Modifications Nos. 3, 4, 6, 13, 14, 15, 16, 17, 19, 21, 23, 25, 32, 35, 42, 44, 53, 55, 57, 58, 63, 68, 73, 74, 75, 78, 79, 85, 88, 89, 91, 94, 95, 96, 97, 101 and 103.

b. All changes required under Field Orders Nos. 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 63, 66, 67, 68, 69, 70, 71, 72, 74, 75, 76, 77, 78, 80, 81, 83, 84, 85, 86, 88, 90, 91, 94, 95, 96, 97, 99, 100, 102, 103, 104, 105, 106, 107, and 108.

c. Claims Nos. C-1, 2, 3, 4, 5, 6, 7, 8, 10, 14, 15, 16, 18, 20, 23, 24, 30, 33, 37, 39, 40, 41, 42, 43, 45, 47, and 49.

2. Negotiations between Contractor and Government personnel were held on 12, 13, 14, 15, 18, 19, 21, and 28 September, and 3, 4, 5, and 6 October 1961. Major differences were isolated in the values placed on all of the phases of the work by Contractor and Government estimators. Modification No. 57 was settled separately and divorced by mutual consent from the composite approach. The scope of the proposal was expanded and clarified during the course of negotiations as including all unresolved modifications and claims (recorded or potential) related to any and all actions by the parties to the contract, and all incidents EXCEPT: Adjustments in contract price for assignment of Assigned Services Contracts; adjustments for modifications to work performed by ASC subcontractors; and claims originating from ASC subcontractors. Also, Contractor representatives stated that they were not willing to commit themselves to an agreement which would leave claims for separate consideration.

3. Attendees at the conference on 6 October 1961 were as follows:

Contractor	Government
Mr. L. G. Everist	Col. W. W. Wilson
Mr. M. F. Warner	Col. John E. Minahan
Mr. M. F. Travis	Lt. Col. Hal L. Schroeder
	Mr. S. D. Broselow
	Mr. J. M. Petersen
	Mr. L. A. Duscha
	Mr. H. D. Anderson

Col. Wilson indicated that he had completed a review of the Area Engineer's findings on all of the claims and that estimates, commensurate with his conclusions (where favorable), had been prepared. Therefore, although the formalities of response to the claims would follow later, an overall proposal (excluding ASC involvement cited above) could be considered. Mr. Everist stated that on the overall approach basis, he could reduce his proposal to 50.5 million dollars. For comparison with the original quotation of $29,839,441.24 this breaks down approximately as follows:

Basic 12 Site Amount:	24.3
Executed Mods	.3
ASC Assignments	3.7
Subtotal	28.3
This proposal	22.2
	50.5

4. Col. Wilson indicated that this was considered excessive and negotiations were continued to refine overall differences and scope of the proposal. Contractor representatives agreed that their proposal encompassed all costs in connection with ASC subcontractors except amounts that flow directly to the ASC subcontractors and that any adjustments in these amounts (from $3,721,337.43 used as basis for interim payment modifications 82 and 92) together with the amounts settled on for outstanding modifications and valid claims (if any) would change the prime contract amount the exact same amount. It was established that the proposal also covered additional ring beams which, under the terms of the contract, are paid for directly at the unit price of $0.20 per pound. Mr. Everist said that an overall settlement would release the Government of any and all claims or demands for additional time or money, whether presented by the Contractor on its own behalf or on behalf of suppliers or subcontractors arising directly or indirectly from the work under the contract except as follows:

a. Total adjustment in contract price of DA-6186 for assignment of the Assigned Services Contracts, which adjustment shall be the amount subsequently agreed upon as the amount due the ASC subcontractors and therefore payable by Western Contracting Corporation in accordance with the terms of the various contracts assigned.

b. Adjustments in contract price of DA-6186 for modifications to work performed by ASC subcontractors under the assigned contracts, which adjustment shall be the amount subsequently agreed upon as the amount due the ASC subcontractor and therefore payable by Western Contracting Corporation in accordance with the terms of the various contracts assigned.

c. Adjustments, if any, in contract price of DA-6186 arising out of claims presented by ASC subcontractors, which adjustment, if any, shall be the amount found due the ASC subcontractor and therefore payable by Western Contracting Corporation under the terms of the various contracts assigned.

d. Adjustments, if any, in contract price of DA-6186 for changes ordered after 6 October 1961 or claims arising out of instructions or other incidents after 6 October 1961, which shall be subject to the terms and provisions of the contract.

5. Through further discussion the proposal was reduced to an acceptable amount but it was agreed that numerous minor points, which would have a bearing on exact final figure, remained to be cleared up. Col. Wilson and Mr. Everist agreed to leave these details to be worked out between the Area Office and the Contractor's local office from the following basis:

This proposal		21.5
Fixed amount for 12 Sites (including Modifications 11, 12 and 57)	24.3	
Fixed amount of executed mods	.3	
ASC: Variable as noted above	3.7	
	28.3	+28.3
Variable amount for ASC subcontractors pending modifications and claims		+XX.X
CONTRACT AMOUNT ($14,065.44 over and above this amount to be paid for additional ring beams at $0.20 per pound)		XX.X

JOHN E. MINAHAN
Col. Corps of Engineers
Area Engineer

M. F. WARNER
Western Contracting Corporation

RESUME OF NEGOTIATION

14 November 1961

1. Reference paragraph 5 of Resume of Negotiation, 6 October 1961, wherein Colonel W. W. Wilson and Mr. L. G. Everist agreed to leave details of final negotiation to be worked out between the Area Office and the Contractor's local office from the following basis:

This proposal		21.5
Fixed amount for 12 Sites (including Modifications 11, 12 and 57)	24.3	
Fixed amount of executed mods	.3	
ASC: Variable as noted above	3.7	
	28.3	+28.3
Variable amount for ASC subcontractors pending modifications and claims		+XX.X
CONTRACT AMOUNT ($14,065.44 over and above this amount to be paid for additional ring beams at $0.20 per pound)		XX.X

2. Aside from this negotiation but bearing on it are negotiations conducted at Fort Worth District on 11 and 12 October 1961 (subsequent to the previous negotiation on this composite proposal). Agreements were reached there on all outstanding modifications and claims, then known, as follows (see notes filed with Modifications Nos. 92 and 112):

a.	Assigned Value of DA-5761	$1,618,905.36
b.	Amount for PLS Portion of FO-37	1,338.60
c.	Amount for PLS Portion of FO-72	828.00
d.	Amount for all other changes & valid claims	74,714.60
		$1,695,786.56

e. PLS Scheduled completion dates (to be provided for in the revised assignment):

Site No.	Sch. Comp. Date
1	7 July 1961
2	4 August 1961
3	27 May 1961
4	30 June 1961
5	26 July 1961
6	23 June 1961

Site No.	Sch. Comp. Date
7	29 August 1961
8	20 September 1961
9	23 June 1961
10	28 August 1961
11	31 August 1961
12	23 August 1961

3. Aside from this negotiation but bearing on it are negotiations conducted in the Lincoln Area Office on 31 October 1961 in connection with ASC subcontractors other than PLS (see notes filed with Modification No. 82). No overall agreement having been reached, the status of Modification No. 82, and any modifications and claims arising out of the work under the contracts thereby assigned remains unchanged from status on 6 October 1961. It was agreed that the valid extra cost in connection with installation of the elevator, although stemming from the same causes and conditions as those considered in this composite and therefore properly part and parcel thereof, would be considered separately to avoid undue delay in processing the composite settlement pending settlement of these ASC subcontract amounts.

4. A meeting, attended by the following was held in the Lincoln Area Office on 2 November 1961:

For the Contractor	For the Government
Mr. M. F. Warner	Mr. H. D. Anderson
Mr. W. F. Boyle	Mr. F. L. Tilley
Mr. L. B. Reiling	

The following accounting and disposition of the modifications, field orders, and claims recorded to date was agreed upon:

a. Cancelled Modification Numbers: 7, 8, 9, 10, 22, 24, 26, 27, 28, 29, 30, 31, 34, 37, 38, 40, 43, 48, 54, 60, 70, 72, 80, 83, 84, 87, 90, 98, 99, 105 and 110. A total of 31.

b. Cancelled Field Order Numbers: 14, 28, 62, 64, 73, 87, and 93. A total of 7.

c. Executed Modifications: 1, 2, 5, 11, 12, 18, 20, 33, 36, 39, 41, 45, 46, 47, 49, 50, 51, 52, 56, 59, 61, 62, 64, 71, 76, 81, 95, and 108. A total of 28.

d. Field Orders incorporated into Modification No. 100: 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 63, 66, 67, 68, 69, 70, 71, 72, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 88, 90, 91, 94, 95, 96, 97, 99, 100, 103, 105 and 106. A total of 83. It was agreed that Modification 100 and therefore these 83 field orders were covered in the composite negotiation, including the PLS portions of FO-37 and FO-72 which were settled separately (see paragraph 2 above) for $1,338.60 and $828.00 respectively.

e. Modifications and Field Orders to be included in Modification No. 112: M-numbers as follows: 65, 66, 67, 69, 77, 86, 93, 104 and 106. A total of 9. FO-numbers as follows: 15, 16, 43, 58, 65, 82, 89, 92, 98, 109, and 114. A total of 11. It was noted that since the changes previously identified by the nine M-numbers referenced above would be covered by Modification No. 112 it would be necessary to administratively cancel these nine modification numbers.

f. Other Modifications settles but not yet executed: 57, 92, and 112. A total of 3 as follows:

Mod. 57: $265,000.00 and no change in contract time.

Mod. 92: $1,618,905.36 and no change in contract time except in those cases where time adjustments otherwise granted for milestone 10 under Contract DA-6186 fail to carry milestone 10 to or beyond the dates cited in paragraph 2e above, in which cases time for milestone 10 will be extended (in Modification No. 92) to these dates.

Mod. 112: $74,714.60 and no change in contract time.

g. Field Orders to be written into Modification No. 100 by supplement thereto: 48, 49, 101, 102, 104, 107, 108, 110, 112 and 113. A total of 10. It was agreed that work contemplated by FO-113 had been completed and any future work of this nature would be for separate consideration. It was agreed that these 10 field orders were covered in the composite negotiation and therefore that Modification No. 100, as it will have been amended to cover 93 field orders is covered in the composite negotiation.

h. Field Order number open for future implementation or cancellation: 111. A total of 1.

i. Modification No. 82 covers the assignment of all ASC subcontractors except DA-5761. The price of $2,399,040.75 used in tabulation hereinafter is for comparative purposes only and is subject to change as a result of future negotiation as indicated in paragraph 4a

of Resume of Negotiation, 6 October 1961. A total of 1.

j. Modifications covered by composite negotiations: 3, 4, 6, 13, 14, 15, 16, 17, 19, 21, 23, 25, 32, 35, 42, 44, 53, 55, 58, 63, 68, 73, 74, 75, 78, 79, 85, 88, 89, 91, 94, 96, 100 (all Field Orders per subparagraphs 4d and 4g above), 101, 103 and 109. A total of 36. It was agreed that an errata sheet was needed on Modification No. 101 to confirm the elimination of the requirement to procure and turn in to the Government twelve (12) control valves and twelve (12) pressure switches. It was noted that it may be administratively desirable for the Government to include the valid claim items identified as Modification Numbers 103 and 109 in Modification No. 102 proper, in which case these two numbers would be cancelled.

k. Field Order No. 3 is covered by Modification No. 94 which is included in the composite negotiation. Field Order No. 30 is covered by Modification No. 108 which is completely executed. A total of 2.

l. Modification No. 97 is a time extension which had been protested by the Contractor. It was agreed that the Contractor would withdraw his protest in writing. A total of 1.

m. Modification No. 102 is the instrument that is to be used to consummate price adjustment for the composite settlement. A total of 1.

n. Modification No. 107 is the instrument that is to be used to consummate the time agreement for the composite settlement. A total of 1.

o. Modification No. 111 is a time extension for unusually severe weather in May 1961 which will be sent to the Contractor for signature about 3 November 1961. A total of 1.

p. Claims disposed of by converting to or including with modifications or field orders (the applicable modification number is shown in parenthesis): 4(109), 9(97), 11(57), 12(15), 13(17), 19(49), 22(100), 25(100), 26(100), 27(100), 28(100), 29(103), 34(100), 35(4), 36(100), 44(32), 46(100), 51(111), 53(100), 54(100), 55(100)*, and 57(112). A total of 22. It was agreed that settlement against the referenced modification had or would satisfy the claim item and thereby release the Government from any further obligation. *The parts pertaining to trimming floor plates around gusset plates and filling gaps in floor plates around gusset plates is not to be covered by modification and therefore falls in the category of claims to be withdrawn in accordance with subparagraph 4s below.

q. Claims on which a Contracting Officer's decision has been issued and, by virtue of the fact that no appeal was taken within 30 days, the Contractor has surrendered his rights for administrative remedy and does not intend to pursue further: 17 and 43. A total of 2.

r. Claims to be covered by Modification Number 102: 1, 2, 3, 5, 6, 7, 8, 14, 15, 21, 37, and 47. A total of 12.

s. Claims previously withdrawn or to be withdrawn in consideration of the composite negotiation: 10, 16, 18, 20, 23, 24, 30, 33, 39, 40, 41, 42, 45, 48, 49, 52, and 56. A total of 17. In addition, contract waives all other claims except as specifically noted herein and in subparagraph 4a, 4b, 4c and 4d of Resume of Negotiations, 6 October 1961.

t. Claims withdrawn in consideration of the negotiation referenced in paragraph 2 above: 31 and 38. A total of 2.

u. Unresolved claims: 32 and 50. A total of 2. Claim C-50 originated with Otis Elevator Co. under ASC DA-4240; for action to date on this refer to paragraph 3 above.

5. As of 2 November 1961 112 Modification Numbers, 114 Field Order Numbers, and 57 Claim Numbers had been recorded. In the preceding paragraph 4 these are accounted for as follows:

Subparagraph	No. of Mod. Nos.	No. of FO Nos.	No. of C Nos.
a.	31	-	-
b.	-	7	-
c.	28	-	-
d.	-	83	-
e.	9	11	-
f.	3	-	-
g.	-	10	-
h.	-	1	-
i.	1	-	-
j.	36	-	-
k.	-	2	-
l.	1	-	-
m.	1	-	-
n.	1	-	-
o.	1	-	-
p.-u.	-	-	57
Totals	112	114	57

6. Contractor's representatives noted that, in consonance with paragraph 4d of Resume of Negotiation, 6 October 1961, changes or claims which may arise out of actions after 6 October 1961 (12 October 1961 for PLS ASC) are not included but are again subject to the terms of the contract. Two specific examples were agreed upon, namely, (a) Coring of Silo doors at Site 4 directed by letter on 1 November 1961, and (b) Replacing PLS spool piece OFC-1 directed by telegram on 1 November 1961.

7. Contractor's representatives were advised that the "time" study had been completed but that final dates and liquidated damages had not been fixed since the question as to whether or not a sequence change was in order (refer to letter from Western Contracting Corporation to Area Engineer, 9 January 1961, which states, in part, "Since our requests for extension of time, submitted to date, have not been resolved, we reserve the right to re-evaluate the sequence of Sites to the best interests of Western Contracting Corporation at such time as these matters have been concluded".) It was agreed that, in the light of current information, a sequence change to minimize liquidated damages was in order.

8. The foregoing clearly establishes the intent of both parties that agreement be reached and final settlement made, to the greatest extent feasible, covering the equitable adjustments for completion of the work at all Sites. In consonance with this, it was agreed that Government representatives would figure out the appropriate sequence change so this, together with the final time adjustments and resulting liquidated damages, could be recorded as part of the final negotiation at which the Contractor will present his exact figure.

(End of 2 November 1961 Meeting)

9. On 13 November 1961, Mr. H. D. Anderson met with Mr. W. F. Boyle, and Mr. L. B. Reiling. This record of negotiation was reviewed, surplus material listed in paragraph 10 was agreed upon and Contractor's representatives were advised that the necessary sequence change had been worked out which, together with the time study previously completed, resulted in final scheduled versus actual completion as tabulated below:

FINAL SEQ	Milestone No. 1	2	3	4	5	6	7	8	9	9A	10
	LD Rate ($200)	($200)	(None)	(None)	(None)	($400)	($400)	($100)	(None)	($300)	($1600)
Sch 3	70ct60	22Nov60	13Mar	13Mar	19Apr	24Feb	20May	20May	13May	27May	21Jun
Act	90ct60	12Nov60	18Feb	18Feb	18Feb	18Feb	28Apr	11May	6Jun	27May	6Jun
Days Late	2	-	-	-	-	-	-	-	24	-	-
1	10Nov60	21Dec60	29Mar	29Mar	5May	3 Mar	10Jun	12Jun	22May	7Jul	7Jul
	2Dec60	2Dec60	17Jan	1 Mar	16Mar	3Mar	10May	1Jun	30Jun	30Jun	30Jun
	-	-	-	-	-	-	-	-	39	-	-
2	28Nov60	11Jan	12Apr	12Apr	1Jun	11Mar	30Jun	30Jun	15Jun	4Aug	4Aug
	14Nov60	21Dec	14Feb	15Mar	14Jun	16Mar	13Jun	5Jul	13Jul	4Aug	4Aug
	-	-	-	-	13	5	-	5	28	-	-
9	17Oct60	1Dec60	22Mar	22Mar	28Apr	18Mar	7Jun	7Jun	12May	23Jun	29Jun
	20Oct60	21Nov60	25Feb	25Feb	12May	4Mar	29Apr	9May	26Jun	23Jun	26Jun
	3	-	-	-	14	-	-	-	45	-	-
4	11Dec60	25Jan	15May	15May	20Jun	24Mar	21Jul	21Jul	7Jul	30Jun	13Aug
	18Nov60	3Jan	14Mar	19Apr	19Apr	24Mar	15Jun	22Jun	27Jul	30Jun	28Jul
	-	-	-	-	-	-	-	-	20	-	-
5	24Dec60	26Jan	17May	17May	22Jun	31Mar	21Jul	21Jul	8Jul	26Jul	13Aug
	12Nov60	6Jan	7Feb	7Apr	14Jun	24Mar	29Jun	18Jun	19Jul	21Jul	21Jul
	-	-	-	-	-	-	-	-	11	-	-
6	4Nov60	21Dec60	11Apr	11Apr	17May	6Apr	22Jun	22Jun	31May	23Jun	13Jul
	5Nov60	7Dec60	20Feb	22Feb	31May	10Mar	31May	4Jun	30Jun	23Jun	30Jun
	1	-	-	-	14	-	-	-	30	-	-
11	26Nov60	12Jan	4May	4May	9Jun	13Apr	23Jul	23Jul	24Jun	31Aug	31Aug
	20Nov60	11Jan	2Mar	31Mar	2Aug	6Apr	10Aug	6Jul	9Aug	31Aug	31Aug
	-	-	-	-	54	-	18	-	46	-	-
12	30Nov60	16Jan	8May	8May	16Jun	20Apr	15Jul	15Jul	5Jul	23Aug	23Aug
	29Nov60	28Jan	14Mar	14Mar	9Aug	6Apr	10Aug	19Jul	7Aug	23Aug	23Aug
7	25Feb	10Apr	1Aug	31Jul	6Sep	30May	50ct	50ct	18Sep	29Aug	250ct
	14Dec60	11Feb	10May	9Apr	31Aug	15May	31Aug	8Aug	31Aug	29Aug	15Sept
	-	-	-	-	-	-	-	-	-	-	-
10	23Jan	11Mar	1 Jul	2Jul	7Aug	10Jun	5Sep	5Sep	20Aug	28Aug	26Sep
	4Dec60	25Jan	3Apr	13Jun	8Aug	6Apr	1Sep	21Jul	25Aug	28Aug	1Sep
	-	-	-	-	1	-	-	-	5	-	-
8	18Mar	2May	21Aug	21Aug	26Sep	16Jun	180ct	180ct	90ct	20Sep	7Nov
	8Apr	10Jun	8Sep	29Sep	29Sep	27Apr	29Sep	11Sep	31Aug	20Sep	60ct
	21	39	18	39	3	-	-	-	-	-	-
Days	27	51	18	39	153	5	44	9	281	0	0
Amt.	$5400	$10,200	0	0	0	$2000	$17,600	$900	-	-	-

It was noted that milestone 10 dates for Sites 1, 2, 11 and 12 would be extended to 5 July 1961, 22 July 1961, 15 August 1961 and 11 August 1961 respectively by Modification No. 107 (which would include the sequence change) thereby isolating the effect of assignment of PLS. It was noted that in each case the entire work at these sites, except PLS, was substantially completed on or before these dates. These dates would be further extended to 7 July 1961, 4 August 1961, 31 August 1961 and 23 August 1961 respectively by Modification No. 92, in consonance with the assignment provisions agreed upon between the PLS ASC subcontractor and Fort Worth District (see paragraph 2e above). Modification No. 92 will also fix the dates listed for milestone 9A and establish liquidated damages in the amount of $300.00 per day (which is identical to the sum fixed in the assigned contract DA-5761) for this item. Mr. Boyle indicated that these time adjustments and final assessment of $36,100.00 were acceptable and that the Contractor would not seek further remission of liquidated damages. It was agreed that no actual damages had been occasioned by late completion of work under certain completion schedule items for which no liquidated damages are fixed and therefore the Government would not seek any recovery against these.

10. Mason F. Travis, Project Manager for Western Contracting Corporation was contacted by telephone by Colonel John E. Minahan, Area Engineer on 14 November 1961. In response to Colonel Minahan's request Mr. Travis quoted $21, 498,484.70 as their net composite proposal. This relates to other figures quoted hereinbefore as follows:

This proposal		$21,498,484.70
12 Sites (Incl Mods 11, 12 & 57)	$24,278,000.00	
Fixed Amount of Executed Mods	340,489.03	
Fixed Amount of Mod 92	1,618,905.36	
Other ASC (Variable)	2,399,040.75	
	$28,636,435.14	$28,636,435.14
Fixed Amount of Mod 112		74,714.60
Variable Amount for ASC (other than PLS) modifications and claims		$ X.XX
CONTRACT AMOUNT		$50,209,634.44+

The proposal includes credit for various items of Contractor furnished material made surplus by the changes except the following which is to be turned in to the Government:

QUANTITY	UNIT	REFERENCE	DESCRIPTION
12	Ea	FO-51	36"x36"x6" Telephone Cabinet
24	Ea	FO-69	4½"-100# Water Pressure Guage

It was noted and agreed that: $14,065.44 over and above the "Contract Amount" ($50,209,634.44) was to be paid separately for additional ring beams; $350.00 is to be withheld separately for paint re-testing; variations in amounts of "Other ASC (Variable)" and "Variable amount for ASC (other than PLS) modifications and claims" would vary the "Contract Amount" identically as would any future adjustments made pursuant to paragraph 6 above. The $21,498,484.70 includes the amount of $517,386.00 for Mod. 35 and $18,608,866.00 for interim payment against modification Nos. 3, 4, 6, 13, 14, 16, 17, 23, 25, 32, 42, 55, 58, 68, 73, 74, 75, 94 and 102 and that, leaving these amounts part of the contract, a further increase of $2,372,232.70 is required to satisfy this proposal. Colonel Minahan stated that the proposal was acceptable.

11. Agreement having been reached on all pertinent issues negotiations were concluded.

/s/ M. F. TRAVIS
M. F. TRAVIS
Project Manager
Western Contracting Corporation

/s/ JOHN E. MINAHAN
JOHN E. MINAHAN
Colonel, Corps of Engineers
Area Engineer
Authorized Representative
of the Contracting Officer

RECORD OF FINAL NEGOTIATIONS
WITH PAUL HARDEMAN, INC., AND WESTERN CONTRACTING CORP.
ON ALL MODIFICATIONS, FIELD ORDERS AND CLAIMS
RELATIVE TO PROPELLANT LOADING SYSTEM CONTRACT

Meeting was held 11 and 12 October 1961 in the Fort Worth District Office for the purpose of negotiating an equitable adjustment in time and money for all work performed by Paul Hardeman, Inc., in relation to Item 3 of Contract DA-5761. Those in attendance were as follows:

FOR THE CONTRACTOR:

Fred Smith	Paul Hardeman, Inc.
R. J. Lull	Paul Hardeman, Inc.
H. F. Warner	Western Contracting Corporation
W. F. Boyle	Western Contracting Corporation
K. F. Worthen	Western Contracting Corporation

FOR THE GOVERNMENT:

Maj. Lester Henderson,	Lincoln Area Office, CEBMCO
Capt. Patrick W. Marks	CEBMCO - Atlas "F"
C. G. Hazlewood	Construction Div, Fort Worth District
Max M. Lechter	Construction Div, Fort Worth District
James O. Steele, Jr.	Construction Div, Fort Worth District
Peter J. Garcia	E&T Branch, Lincoln Area Office, CEBMCO
Harold L. Lenz	CA Branch, Lincoln Area Office, CEBMCO
Larry E. Bell	PLS Branch, Lincoln Area Office, CEBMCO

On 11 October 1961, Mr. Steele of Fort Worth District, formally opened the meeting by introducing all present and stated the purpose of the meeting. He informed the group that it would be necessary to settle all Modifications and Field Orders before the assignment portion could be settled. In pursuit of this program, he turned the meeting over to Maj. Lester Henderson as negotiator for the Lincoln Area. The meeting proceeded with discussions as follows:

Mod. 65 (FWD CO-22)

The Sub-contractor was reminded that during previous negotiations at Fort Worth, he had agreed to no cost for Item 3 for CO-22. After some discussion, he agreed to withdraw his proposal of $1,098.12 and settle for no cost.

Mod. 66 (FWD CO-24)

Reference was made to agreement during previous negotiations at Fort Worth on CO-24, Item 3 for $366.36. After a short discussion, the Sub-contractor agreed to revise his proposal of $7,149.73 and settle for $366.36.

Mod. 67 (FWD CO-25)

Again the Sub-contractor was reminded of previous negotiations at Fort Worth during which he had agreed to no cost for Item 3. With this reference, he agreed to withdraw his proposed amount of $8,575.56 and settle for no cost.

Mod. 69 (FWD CO-27)

The Sub-contractor had submitted a proposal in the amount of $11,002.33. However, after being reminded that he had been paid for all this work by FWD as per negotiations 9 March 1961, he agreed to withdraw his proposal and settle for no cost.

Mod. 86 (FWD CO-34)

The changes to specifications are on Sections 2 and 4. The Sub-contractor did not submit a proposal. It was mutually agreed there was no cost for Item 3.

Mod. 106 (FWD CO-47)

The Sub-contractor did not submit a proposal and since the only changes provided for are two pressure revisions, it was mutually agreed there would be no additional cost for Item 3.

Field Order FO-15 (FWD CO-31)

All changes to specifications refer to section 9 which is relative to fabrication. The Sub-contractor did not submit a proposal. It was mutually agreed there would be no cost for Item 3.

Field Order FO-16 (FWD CO-33)

The Sub-contractor's proposal for $16,202.52 was considered excessive when compared to the Government estimate of $743.04. During discussion, the Contractor was reminded that he had been paid by FWD for revising the four (4) spools as specified and that the only Item 3 cost should be for lowering two (2) extra spools into the silo and two (2) extra bolt-ups. The Government representatives agreed to revise the estimate to include $9.00 per bolt-up in lieu of $3.00. Thus, the revised Government Estimate indicated a total of $1,002.24 which the Contractor agreed to accept as additional cost for Item 3.

Field Order FO-43 (FWD CO-45)

This change provided for revising the size of "C" Clamps and was paid for by FWD as fabrication. The Sub-contractor did not submit a proposal. It was mutually agreed there was no cost for Item 3.

Field Order FO-58

This Field Order provides for special blow-downs at Site 3 only. The Sub-contractor submitted a proposal for $1,317.08 which was considered excessive when compared to $327.00 in the Government Estimate. Discussion revealed that the proposal included Type A and Type C labor, special, heavy and miscellaneous equipment, and negotiating expenses - all of which were not acceptable. Also, material costs were excessive.

Maj. Henderson, for the Government, offered to increase the amount of labor in the Estimate and settle for $650.00. The Sub-contractor verbally revised his proposal to $800.00 as his minimum figure. With this disagreement, discussion of this Field Order was tabled for the present time. (It was settled later for $650.00 - See Mod. 93 discussion, package deal and summary tabulation.)

Field Order FO-65

This Field Order provides two changes: (1) Adding S. S. Sleeves to copper lines, and (2) Field locate lines HFD-3/4" and HFD-1". The Sub-contractor's proposal of $5,289.24 was considered excessive when compared to the Government Estimate of $744.00.

After discussion of details, the Sub-contractor verbally revised his proposal to $2,250.00. This was not acceptable. Discussions had revealed no basis for revising the Government Estimate. Therefore this Field Order was also tabled for the present time as not agreed. (It was settled later for $744.00 - See Mod. 93 discussion, package deal and summary tabulation.)

Field Order FO-82

This change provides for rotating spool NSU2-4 ninety degrees (90°). The only work involved was to unbolt two (2) flanges, turn spool and bolt-up again. The Sub-contractor's proposal for $3,469.08 was considered excessive. The Government Estimate was $144.00.

After discussing unacceptable items in the proposal, the Contractor verbally revised his quote to $920.00 which was still excessive. Discussions were tabled and the amount for this Field Order was recorded as not agreed at this time. (It was settled later for $144.00 - See Mod. 93 discussion, package deal and summary tabulation.)

Field Order FO-89

This change provides for the addition of bonding of vessels to manifolds and manifolds to pre-fab piping. The Sub-contractor's proposal for $7,835.76 was considered excessive compared to the Government Estimate of $456.00.

After much discussion, Maj. Henderson for the Government, offered to revise the estimate by increasing the cost of labor and material and include costs for some scaffolding and suggested a total cost of $4,044.00 which the Contractor accepted as fair and reasonable.

Field Order FO-92

This change provides for revising the Cold Test Piping to meet field conditions. The Sub-contractor's proposal for $3,519.36 was considered excessive.

The original Government Estimate was $552.00; however, prior to negotiations, this amount was revised, as per FWD review, as follows: exclude welding machine as having been paid by FWD as attendant field costs, adjust labor for handling and welding. Revised total for six sets was $195.22.

During discussions, it was tentatively agreed that only four (4) sets of piping were revised in lieu of six sets - two sets were never uncrated, two sets were already in silo and were removed for revisions. After evaluating these new factors, Maj. Henderson for the Government, offered to settle for $400.00 to revise four (4) sets. The Sub-contractor replied that his minimum figure was $900.00. After another short period of discussion, this subject was tabled as not agreed at this time. (It was settled later for $400.00 - See Mod. 93 discussion package deal and summary tabulation.)

Field Order FO-93

This Field Order was never issued to the Contractor. The work involved was for reducing the pressure in LOX Tanks during PLS testing; however, by letter dated 19 July 1961, WCC was informed that it had been determined that this work was provided for under paragraph 44-04d(1)(c) of the contract specifications and therefore, our previous correspondence on the subject was voided.

It was mutually agreed this Field Order be considered cancelled.

Field Order FO-98

This Field Order was issued as a request for a credit due the Government for not installing a hanger at Site 3 according to Specifications and Drawings; however, it was later determined that this hanger was installed as per direction of the Corps personnel on Site and therefore, no credit was due the Government. It was mutually agreed that this be considered no cost.

Field Order FO-109

This Field Order was issued to make record of the additional Government furnished equipment, consisting of trailers and testing equipment, assigned to Hardeman for his use and to request credit due the Government for the use of same.

By letter dated 29 August 1961, Hardeman indicated he could not offer any credit and therefore would not request any adjustment in contract price.

It was mutually agreed this Field Order be considered no cost.

Field Order FO-48

This change provided for installing angle irons on storage tanks to support PLS piping. This work was considered originally as Prime Contractor's work and as such, was included in previous settlement with Western.

At this meeting, it was agreed that Hardeman performed at least some of the work; however, since Western had included this FO in their Prime Work, they would pay Hardeman.

Hardeman indicated he didn't care who paid him as long as he knew how much. Therefore, it was mutually agreed this FO-48 be excluded from this negotiation and that Western would pay Hardeman the sum of $2,000.00 for his work in lieu of the $4,137.96 requested in his proposal.

Field Order FO-79

This change provides for installing ¼" Flex by-pass line, etc. for temporary air supply to start Diesel engines. This Field Order was also included in previous settlement with Western. Therefore, it was mutually agreed that this work be excluded from this negotiations and Western would settle with Hardeman for any work they had performed. Hardeman had not submitted a proposal for this work.

Field Order FO-37

This Field Order included two (2) changes: (1) revise support for OVP-10" line and (2) revise 3" emergency water line. This Field Order FO-37 was included in previous settlement with Western and was considered originally as entirely settled; however, it was later determined that Hardeman's work, Part I, was not included and should be negotiated at this meeting.

Hardeman had submitted a proposal for $4,367.04 which was considered excessive. After a period of discussion as to amount of material, labor and welding required, Maj. Henderson for the Government, offered to settle for $1,200.00. The Contractor verbally revised his proposal to $1,338.60. After another short period of discussion, it was agreed mutually that the contractor's revised proposal of $1,338.60 was fair and reasonable for Part I of this Field Order.

Field Order FO-72

This Field Order included three (3) parts as follows:

1. Adjust, or replace relief valves PSV-60 and PSV-61
2. Field shim and cope angle on Detail 22
3. Install 2" x 2" x ¼" angle brace between diesel skid and 3" condenser water line.

This Field Order FO-72 was included in the Prime Contractor's Proposal and considered settled during negotiations 6 October 1961; however, it was later determined that Hardeman's work was not included.

Hardeman submitted a proposal for Part "2" in the amount of $4,056.84 which was considered excessive. The Government Estimate was $768.00; however, it had been revised prior to negotiations to exclude cost for welding machine, which had been paid by FWD as attendant Field costs. Thus, the Estimate was quoted as $624.00.

After a period of discussion, Maj. Henderson for the Government, offered to revise the Estimate by increasing the cost for labor and settle for $828.00. The Sub-contractor verbally revised his proposal to $2,340.00 as his minimum figure. More discussion resolved nothing and this Field Order was tabled for the time being as not agreed. (It was settled later for $828.00 - See Mod. 93 discussion, package deal and summary tabulation.)

Field Order FO-87

The only instructions given the Contractor was by telegram dated 25 May 1961, requiring checking float switches FS-9 and FS-10 and check operation of NR-8 regulator.

The Contractor was later informed, by letter to WCC, dated 26 June 1961, that the "proposed work identified in this office as RI-193, Area No. FO-87 has been cancelled". The Sub-contractor, by letter dated 22 September 1961, indicated that he had not been informed of this cancellation until 21 September 1961 and therefore, had completed this work at all 12 Sites and could not consider this work cancelled. He later submitted a proposal for $4,367.04.

During discussions, the Contractor was informed that this work was considered to be covered by the contract specifications, thus the cancellation. The Hardeman representatives did not agree, stating their interpretation was that this called for a re-check after being done once before. Mr. Bell for the Government, replied that records showed that in no case did they perform this work but once. Maj. Henderson said the Government's position must be that this FO-87 was cancelled and would tabulate it at no cost.

Claim - Sweat Type Fittings for Line AFD-1½"

The Sub-contractor submitted his proposal (hand carried to Area Office 6 October 1961 by the Prime) for $8,086.32. The Government considered this should be no cost.

During discussions, it was pointed out that CO-12 had deleted the word "compression type" indicating that they did not meet the code; also by telegram to WCC, dated 24 March 1961, sweat type fittings were approved as acceptable. The Government's position of no cost was due to the assumption that cost for labor and material should be similar for either type fittings and that sweat type should save the Contractor much time in eliminating leaks.

The Contractor contended that we changed the contract and that he had already purchased compression type fittings. At this point, discussions were set aside for this subject to proceed with another. (It was settled later for no cost - See Mod. 93 discussion, package deal and summary tabulation.)

Mod. No. 77 (FWD CO-36)

This modification provided for a very large number of specification changes, some additions, some deletions and clarifications. The Subcontractor's proposal for $56,459.52 was considered excessive.

After a very brief discussion, the Contractor offered to revise his proposal and settle for the same amount as at Salina (Schilling AFB) - $2,650.00.

Maj. Henderson for the Government, indicated that he could not accept that figure because this modification as issued at Lincoln, was somewhat different from Salina's in that several tests were combined; however, he offered to settle for $2,500.00 and that the 12 Test Safety Valves become the property of the Government and be delivered to the Government, FOB Government Truck, Stanton, California. The Contractor accepted this offer and agreed to deliver the Valves as instructed.

Mod. No. 104 (FWD CO-41)

This Modification provides for installation and testing of oil and water removal unit and by Addendum, includes replacing the "Silica-gel in the air drying unit.

The Contractor's Proposal for $40,410.84 was considered excessive compared to the Government Estimate of $8,011.00. After a period of discussion, Maj. Henderson for the Government, offered to revise the Estimate by increasing the cost for labor and settle for $10,000.00, to which the Contractor agreed.

Mod. No. 93

This Modification provides for blowing down oxygen and nitrogen vessels. The Contractor's proposal for $166,984.14 was considered excessive. The Government Estimate was $4,297.00.

During the discussion, many differences were pointed out. The Contractor's Proposal included some $5,000.00 for material, most of which could not be substantiated. The Contractor contended he fabricated and delivered nine (9) blow-horns to Lincoln - 54 horns total for all six Bases. The Area personnel said only three (3) were ever received at Lincoln. The Proposal included 1 week for 7 men for initial blows and 1 day for 7 men for each additional blow, all of which was considered to be far in excess of actual performance.

At this point, Mr. Bell drew a diagram on the blackboard in order to picture more clearly for all what was required to perform this work. Discussion continued for some time; however, it was evident that both sides needed to re-work their costs. Negotiations were halted for this date to be resumed next day.

12 October 1961

Discussion continued on Modification No. 93. As support of the Government's contention of only 3 blow-horns furnished, Mr. Lechter called Dyess AFB and Altus AFB. Dyess reported they were supplied only 1 horn, Altus received none and were using another system. As per previous day's discussion, the Contractor verbally revised his Proposal downward to $66,000.00.

After a long period of discussion on labor and material for Modification 93, Maj. Henderson offered the Contractor a package deal in the amount of $53,481.20 for all Item 3 work (all Modifications, Field Orders and Claims) at Lincoln with the exception of the cost for field modified brackets, which was yet to be discussed. This amount of $53,481.20 was to include a figure of $31,464.00 for Modification No. 93 and that the Claims for (1) Sweat Type Fittings, (2) Helium Vessel Blows at Site 11 and (3) Extra System Blows, be dropped and/or entered as no cost; also, that the Modifications and Field Orders previously discussed were to be included at agreed to, or Government figures.

In reply to the above package deal, the Contractor said he would have to figure this out; however, for the present, he would say that he would not accept or reject this offer until he knew, at least the magnitude, what the settlement was going to be on bracket revisions and the assignment portion. With this problem at hand, Mr. Lull left the Negotiation Room to confer with Mr. Mazelwood on the assignment portion and negotiations proceeded to the next item, brackets, with Mr. Smith representing the Sub-contractor.

Claim - Field Adjustment of PLS Brackets

The Contractor submitted a Lump-Sum Proposal to the Lincoln Area (hand carried to Area Office by Prime Contractor 9 October 1961) in the amount of $68,878.34, which was considered excessive. The detailed breakdown had been submitted to Fort Worth. The Lincoln Area personnel had little or no time to review the breakdown before negotiations; therefore, the discussions centered on scope of work, records, labor, material and items in the Proposal that were unacceptable.

After a long period of discussion, Mr. Smith for the Sub-contractor, verbally revised his proposal downward to $23,400.00, however, adding that this figure had to have concurrence of Mr. Lull and would have to tie-in with the package deal offered during discussion of Modification No. 93. Mr. Lull was in conference with Mr. Hazelwood discussing the assignment portion; thus a recess for this negotiation group to await decision of Mr. Lull.

After a short recess, Mr. Lull joined the group and commented that he would accept the figure for the package deal if the Government would take his figure for the Brackets. It was agreed. Therefore, this Claim for Brackets was considered settled for $23,400.00.

Conclusion

The agreement on Brackets concluded the negotiations on all Modifications, Field Orders and Claims for the Lincoln Area (See attached sheet for Summary Tabulation of Settlement), except the assignment portion which was being handled by Fort Worth.

Assignment: (Lincoln Mod. No. 92, DA-6186; FWD CO-21, DA-5761

This portion was handled entirely by Fort Worth; however, Lincoln personnel were consulted on several items for information. Mr. Lull had been in conference with Mr. Hazelwood; therefore, as soon as the Modifications and Field Orders were settled, the results were co-ordinated with the assignment portion and agreement reached soon thereafter. The agreed figure for the assignment was $295,800.00.

Prime Contractor's Mark-up

During negotiations at Lincoln Area Office completed 6 October 1961, agreement was reached on all costs due Western Contracting Corporation for Contract DA-6186. This agreement included a stipulation that Western Contracting Corporation would not require any mark-up on Paul Hardeman, Inc. settlement for Item 3, DA-5761. Therefore, Western Contracting Corporation will be paid only the amount agreed to with Paul Hardeman, Inc. at this meeting and this amount will subsequently be paid by Western Contracting Corporation to Paul Hardeman, Inc.

Agreement and Release

All costs having been resolved, an agreement was drawn up and signed by representatives of both the Prime Contractor - Western Contracting Corporation and the Sub-contractor - Paul Hardeman, Inc. This agreement (see attachment) stipulated that Paul Hardeman, Inc. agreed to accept the amount of $1,695,786.00 as full and final payment from Western Contracting Corporation for all labor, etc., in connection with the assigned portion of Contract DA-5761; also, that Paul Hardeman, Inc. released Western Con-

tracting Corporation and the Government from any and all claims and further liability and that Western Contracting Corporation released Paul Hardeman, Inc. from any and all claims and further liability in connection with the assigned portion of Contract DA-6186.

The above total is arrived at as follows:

All Mods., FO's and Claims as per this negotiation	$ 76,881.00
Assignment portion as per this negotiation	295,800.00
Sub-Total	$372,681.00
Previously negotiated and agreed	1,323,105.00
TOTAL Assigned	$1,695,786.00

/s/ H. L. LENZ
H. L. LENZ
Contract Administration Branch
19 October 1961

SUMMARY TABULATION

PLS MODIFICATIONS, FIELD ORDERS AND CL
Assigned Portion Contract DA-5761, Ite

LINCOLN RI #	LINCOLN Mod.#	FWD CO #	SUB-CONTRACTOR'S PROPOSAL	GOV'T ESTIMATE ORIGINAL
65	M/65	22	$1,098.24	NC
66	M/66	24	7,149.73	$429.02
67	M/67	25	8,575.56	NC
69	M/69	27	11,002.33	NC
77	M/77	36	56,459.52	-8,455.00
86	M/86	34	None	NC
93	M/93		166,984.14	4,297.00
183	M/104	41	40,410.84	8,011.00
191	M/106	47	None	NC
115	FO-15	31	None	NC
116	FO-16	33	16,202.52	743.04
137	FO-37 Part I)		4,367.04	192.00
143	FO-43	45	None	NC
148	FO-48		4,137.96	(Included in Mod. 1
158	FO-58		1,317.08	327.00
166	FO-65		5,289.24	744.00
173	FO-72 Part b)		4,056.84	768.00
180	FO-79		None	(Included in Mod. 1
187	FO-82		3,469.08	144.00
193	FO-87		2,396.76	Cancelled
195	FO-89		7,835.76	456.00
198	FO-92		3,519.16	552.00
199	FO-93		None	Cancelled
204	FO-98		None	NC
217	FO-109		None	NC
225	FO-114 Bracket Adjust)		68,878.34	
Claim - Sweat type fittings			8,086.32	---
Claim - Helium vessel blows			13,720.10 (Site 11)	---
Claim - Add. System Blows			Not Submitted	---
	TOTAL		$434,956.56	

* Mod. No. 77 - Government equipment, 12 ea. test Safety valve
at Stanton, California

12 October 1961

Paul Hardeman, Inc., hereby agrees to accept the amount of $1,695,786 as full and final settlement from Western Contracting Corporation for all labor, equipment, plant and material furnished, and all work performed in connection with Contract No. DA-25-066-eng-6186 and the assigned portion of Contract No. DA-41-443-eng-5761.

Paul Hardeman, Inc., further hereby releases Western Contracting Corporation and the United States of America from any and all claims and from any further liability whatsoever arising out of the work performed by Paul Hardeman, Inc., under Contract No. DA-25-066-eng-6186 and the assigned portion of Contract No. DA-41-443-eng-5761.

For and in consideration of the foregoing, Western Contracting Corporation hereby releases Paul Hardeman, Inc., from any and all claims and from any and all liability whatsoever arising out of the work performed by Paul Hardeman, Inc., under Contract No. DA-25-066-eng-6186 and the assigned portion of Contract No. DA-41-443-eng-5761.

/s/ R. J. Lull
PAUL HARDEMAN, INC.

/s/ M. F. Warner
MEREDITH F. WARNER
Western Contracting Corporation

MEETING WITH FIELD PERSONNEL ON BACKFILL PROBLEMS

1. On 10 April 1961, a symposium was held in the Lincoln Area Office to discuss backfill problems at all sites. The symposium was opened at 1030 hours. Those in attendance were:

Colonel John E. Minahan, Area Engineer
Lt. Col. H. L. Schroeder, Executive Officer
L. P. Theriault, Deputy Area Engineer
A. L. Reed, Chief, Construction Branch
C. S. Moore, Project Coordinator, Atlas F
J. P. Shields, Asst. Chief, Construction Branch
Major E. F. Brady, Acting Safety Engineer
Capt. R. A. Bush, Chief, Estimating Section
Capt. E. C. Fike, Chief, P & R Branch
Lt. F. L. Farnsworth, Testing Officer
Lt. P. R. DeMaagd, Liaison Officer
J. J. O'Neill, Materials Technician
E. J. Donahue, Palmyra Resident Engineer
E. T. Garrett, Cortland Resident Engineer
C. J. Lenander, Seward Resident Engineer
D. J. Nessan, Eagle Resident Engineer
A. N. Thurber, Support Facilities Resident Engineer
J. J. Drake, Site Engineer, Site 1
K. F. Lauritsen, Site Engineer, Site 2
G. F. Sweet, Site Engineer & Backfill Inspection, Site 3
C. A. Carlson, Site Engineer, Site 4
R. W. Deadman, Site Engineer, Site 5
J. F. Rogalla, Site Engineer & Backfill Inspection, Site 6
J. Hallahan, Site Engineer, Site 7
E. D. Ellis, Site Engineer, Site 8
G. M. Snydal, Site Engineer, Site 9
H. S. Kusmierski, Site Engineer, Site 10
G. S. Craven, Site Engineer, Site 11
E. K. Buntrock, Site Engineer, Site 12
F. D. Cook, Project Inspector, Missile Assembly Building
E. O. Nelson, Backfill Inspector, Site 1
K. C. Zimmerman, Backfill Inspector, Site 2
J. A. Tally, Backfill Inspector, Site 4
J. L. Steckler, Backfill Inspector, Site 5
L. H. Smith, Backfill Inspector, Site 7
J. F. Connor, Backfill Inspector, Site 8
C. F. Bowen, Backfill Inspector, Site 9
C. D. Scott, Backfill Inspector, Site 10
R. P. Hauth, Backfill Inspector, Site 11
C. A. Wiggin, Backfill Inspector, Site 12
D. E. Pond, Construction Management Engineer

2. Colonel Minahan opened the meeting by stating that the purpose of the symposium is to discuss and attempt to resolve backfill problems in this Area. Colonel Minahan further stated that the problems experienced in this Area are not unique as some other Areas are faced with similar problems; therefore, Commanding General, CEBMCO, had directed all Area Engineers to hold these meetings. One of the major difficulties which must be overcome is the time element which requires placement of backfill during adverse climatic conditions. In order to meet the contract completion dates and insure against future settlement, it is the job of every Inspector to see that backfill is placed according to all provisions of the plans and specifications. If any doubt exists as to the suitability of material or adequacy of methods, the problem should be brought to the attention of the supervisory personnel so that a prompt resolution can be made and guidance furnished.

3. After stating the purpose of the meeting, Colonel Minahan cautioned all Inspectors that backfill requirements vary in different areas and are covered in several sections of the specifications. Colonel Minahan stated that these variances would then be covered and read the specifications for backfilling in the utility tunnel area. Mr. Theriault stated that CEBMCO and AFBMD were questioning the use of the concrete saddles under the tunnels. The use of the saddle is contrary to the design criteria for flexibility; therefore, should not be used. Mr. Reed asked if it would be satisfactory to use a concrete pad rather than the saddle and after discussing the matter, Col. Minahan said that no concrete would be placed under the tunnels without specific instructions from the Area Office. Mr. Theriault requested all Inspectors to take measurements of the tunnels when they are installed as a control to determine the amount of actual settlement or distortion at any later date. Col. Minahan then pointed out the key backfill requirements contained in the utility tunnel section of the specifications. Material is to be placed in six inch lifts and compacted to 95% of maximum density with mechanical tampers or rammers. Mr. Reed stated that this compaction requirement is to be met for 8 feet on either side of the tunnel and to 18 inches above the tunnel. Col. Minahan said that in order to meet this requirement, density tests should be taken at the outer or 8 foot limit along with tests taken near the tunnel. Mr. O'Neill recommended the use of an air tamp hammer, in the type of material encountered, in order to obtain the required density; however, if sand is used, he recommended the use of a vibratory plate type tamper. Mr. Garrett questioned the compaction requirement when sand is used around the tunnel. The general specifications call for maximum density where sand or gravel are used for fill; however, the utility tunnel backfill section calls for 95% of maximum and does not differentiate between types of material. Mr. O'Neill stated that he interprets the specifications to require only 95% of maximum density for all types of material used in the utility tunnel area.

4. Col. Minahan next stated that the specification covering stock piling warrants attention as it is written so that compliance should assure that good materials will be found when backfill commences. Mr. Reed said that the fallacy of this section is the limitation of space which results in a mixture of materials. Col. Minahan then cautioned all Inspectors to check with the Area Office if there was any question as to the suitability of any backfill materials. Extra effort in the selection and use of material may preclude failures at a later date. Col. Schroeder asked if the Laboratory Technicians are matching the test results to the proper curve in order to obtain the actual densities. Mr. O'Neill said that there is very little difference between the curves and there would be only a minor error if the wrong curve was used.

5. Col. Minahan stated that there should be no misunderstanding about the relaxation of the moisture requirement. Col. Minahan said that the contractor has been allowed to place material above the moisture limits; however, the specified density must be obtained. This waiver applies only in areas of non-critical backfill in the open cut area from Elevation 990 to 998. All backfill in the utility tunnel and vestibule area must be placed according to specifications. Col. Minahan stated that any material in the utility tunnel area that shows a density of 95% with a moisture content of from 2 to 3% above specification would be questionable and further tests should be made.

6. After thoroughly reading and explaining the general backfill requirements contained in Sections 2 and 3 of the specifications, Col. Minahan called the Inspectors' attention to backfill requirements contained in other sections pertaining to the utilities systems, access roads and parking areas. The general specifications apply in all areas; however, there are specific instances where further requirements must be met. Col. Minahan also stated that proper drainage is required in open areas and should be provided so that water is not allowed to pond or seep into the fill area. Mr. Theriault asked about the relationship between field personnel and Western Laboratory personnel, in other words who determines where to take the tests. Mr. Reed said that it was the policy of the field personnel to tell the laboratory people what general area was to be tested and leave it up to them as to the exact location. On this subject, Col. Minahan stated that this function was not a divided responsibility as the laboratory people are responsible to the site personnel who are responsible for good results. In other words, expend every effort to assure yourself that the specifications are being complied with and that satisfactory results are obtained.

7. Meeting adjourned at 1230 hours.

8. A supplemental meeting was held at 1315 hours with Major L. J. Henderson in attendance.

BREAKDOWN OF CONSTRUCTION WORK

There were three main divisions of construction work involved in the Atlas F Program: Launch Control Center (LCC), Silo and Site work. The following gives a breakdown of each of these major categories:

I. LAUNCH CONTROL CENTER

A. Reinforced Concrete (Bldg. proper, stairwell and entry tunnel)

1. Floor and column base, includes reinforcing.
2. Walls (column & stairwell)
   a. Static forms
   b. Slip forms
   c. Supported slab forms
   d. Embedded metal
   e. Concrete
3. Bldg. Roof
   a. Supported slab forms
   b. Air Cylinder spring support anchors
   c. Vestibule and escape hatch.
4. Entry Tunnel
5. Waterproofing

B. Hung Floor

1. Framing
2. Handrail
3. Steel decking
4. Ribbed metal siding
5. Air cylinder spring supports installation, (ASC)

C. Blast Closure Installation (ASC)

D. Metals

1. Utility tunnel
2. Ladders
3. Escape hatch
4. Entry tunnel doorway
5. Monorail
6. Stairways
7. Miscellaneous

E. Cable Trays Installation

F. Heating, Ventilation and Air Condition (ASC)

1. Ventilation
2. Air Conditioning (Heating and cooling)

I. LAUNCH CONTROL CENTER (continued)

H. Plumbing

1. Piping
   a. Water
   b. Sewage
2. Equipment
   a. Fixtures and water heater
   b. Sump and sewage pumps
3. Compressed air system
   a. Tanks
   b. Piping and mechanical controls, including supports

I. Electrical

1. Grounding system
2. Telephone and P.A. and fire alarm
3. T. V.
4. Power distribution (including transformers and panels)
5. Lighting (conduit, panels, and fixtures)
6. Facility Remote Control Panel (FRCP)
   a. Panels
   b. Conduit and wiring
7. Controls
   a. Blast closures
   b. Water wells
   c. Air receiver
   d. Sewage
   e. Blast detector
   f. Floor leveling
8. Power Remote Control Panel (PRCP)

J. Interior Finish

1. Carpentry
2. Floor covering
3. Metal partitions
4. Glass and glazing
5. Painting
6. Food service equipment
7. Builders hardware

II. SILO

A. Excavation and Fill

1. Open
2. Shaft
3. Ring beams
   a. Lagging
4. Backfill
5. Pneumatic concrete
   a. Wire mesh
   b. Gunite
6. Sight tube

B. Concrete

1. Floor
   a. Isolated footings
   b. Slab
2. Walls
   a. Slip forms
   b. Static forms
   c. Supported slab forms
   d. Embedded metal
   e. Reinforced concrete
3. Air shafts
   a. Forms
   b. Reinforced concrete
4. Waterproofing

C. Crib and Suspension System

1. Crib erection
   a. Framework
   b. Checker-plate flooring
   c. Grating
   d. Spiral staircase and ladder
2. Crib positioning
3. Suspension bracket installation (GFP)
   a. Upper suspension brackets
   b. Lower suspension brackets
4. Shock hanger installation (GFP)
   a. Upper bearing plate and upper shock hanger rods
   b. Shock hanger spring capsule and lower shock hanger rods

D. Blast Closures Installation (ASC)

II. SILO (continued)

E. Launch Platform

1. Counterweight installation (GFP)
2. Guiderails (GFP)
3. Drive base (GFP)
4. Drive mechanism (GFP)

F. PLS Vessel Installation

1. LO_2 storage tank
2. LO_2 topping tank
3. LN_2 storage tank
4. LN_2/He heat exchanger
5. Gaseous helium storage
6. Gaseous nitrogen storage
7. Gaseous oxygen storage

G. Prefabs and Interconnecting Piping (ASC)

H. Diesel Generator Installation (ASC)

I. Cable Trays and Switch Gear Installation (ASC)

J. Facility Elevator Installation (ASC)

K. Heat and Vent, Air Conditioning Equipment and Pumps Installation (ASC)

1. Ventilation
2. Air conditioning (H and AC)

L. Electrical

1. Grounding
2. Telephone and P.A.
3. Lighting and fixtures
4. Power distribution, transformers, and cabinets
   a. Essential
   b. Non-essential
5. Detection systems
   a. Gas detection (RP-1, Oxygen and diesel fuel)
   b. Fire detection and alarm
6. Control
   a. Heating
   b. Refrigeration
   c. Ventilation
   d. Diesel generators
   e. Blast closures
   f. Compressed air
7. Facilities cabinets and wiring
   a. Terminal
   b. Interface

II. SILO (continued)

M. Compressed Air System

N. Silo Cap and Door

1. Cap
2. Silo overhead door hinges system installation (ASC)

O. Plumbing

P. Interior Finish

1. Miscellaneous metal
2. Sheet metal work
3. Hollow metal doors
4. Builders hardware
5. Painting

III. SITE WORK

Paving, Yard Work and Security Fencing

A. Fencing

1. Boundary
2. Security

B. Access Road

1. Grading and drainage
2. Base course
3. Surfacing

C. Complex Area

1. Excavation and fill
2. Roads and paved areas
   a. Subgrade
   b. Base course
   c. Surfacing
      (1) Type I concrete
      (2) Type II 12" Bituminous
      (3) Type III 7" Bituminous
3. Posts, bumpers, and area striping
4. Theodolite station
5. Seeding and sodding

D. Utilities and Electrical

1. Water system
   a. Tanks
   b. Piping
   c. Water Treatment Plant
   d. Pump Houses and equipment
2. Diesel fuel system
   a. Tanks
   b. Piping
3. Sanitary sewer system
   a. Filter bed
   b. Septic tank
   c. Lines and manholes
   d. Waste water
   e. 9 inch silo force line
4. Cooling tower and piping
5. Electrical
   a. Underground communication lines
   b. Underground control lines
   c. Underground power lines
   d. Flood lighting
   e. Warning lights
   f. Blast Detection Sensors (ASC)

OCE SOILS TEAM REPORT

LINCOLN ATLAS F

12 to 13 June 1961

1. Project Description

The facility consists of twelve (12) Atlas F silos, which are located to the East, South, and West of the Base, at maximum distances of 60, 53, and 64 miles, respectively. The basic contract cost was $24,013,000 which has been increased to about $37,000,000 as a result of modifications.

2. Foundation Investigations

a. Scope of Site Selection

The sites were selected by a AFBMD Team which included representatives of SAC, AFRCE, the A & E, and the Omaha District. The original sitings in the Fall of 1958 were for an Atlas F 3 x 3 configuration. This was followed in the Spring of 1959 by selections for a 1 x 9 configuration. These site locations were changed to Atlas F (i.e. silos) by an administrative decision and three additional sites were selected in the Spring of 1960.

b. Scope of Explorations

The sites selected for construction were investigated by seismic methods, and soils and core borings. Pumping tests were performed at those sites which presented difficult ground water problems. Three sites were investigated by Woodward-Clyde-Sherard and Associates under a contract administered by the Omaha District.

c. Scope of Tests

The laboratory tests included: gradation; compaction; unconfined compression; soil classification; consolidation (on undisturbed samples), and swell. Consolidation tests on remoulded samples were not performed until the Spring of 1961. These tests were made in connection with a study of settlement which had occurred in the backfill under the LCC Vestibules.

3. Specifications

a. General

Those portions of the specifications dealing with fill and backfill and with the compaction of these materials, are considered generally adequate but have not been particularly site-adapted. General comments made by the team on specifications for the Plattsburgh Area also would apply here. Some minor inconsistencies were noted; for example, lift thicknesses for compacted fill materials are specified as 6 and 4-inch loose lifts for rolling and hand compaction, respectively, 6 inches for backfill, and 6 inches compacted thickness around the utility tunnel (where hand operations are a necessity and a higher density requirement is specified). The team feels that specifications should be more consistent with respect to lift thickness for different materials, different types of compacting equipment, and different density requirements.

b. Bedding of Utility Tunnels

The specifications for the bedding of the utility tunnels are unclear in that they do not recognize the necessity for embedment

of the pipe corrugations into the underlying material at the time of placement, and the difficulties attendant on compacting soil materials beneath the haunches of the tunnel. Also they do not recognize the difficulties in placing the neoprene seals around the outside of the tunnel after it has been bedded. Suggested methods for improving these practices are covered in a later section of this report.

4. Contractor -- Western Contracting Corporation

The Area Engineer reported that the Contractor experienced considerable difficulty in excavating and shafting the silos resulting in a more expensive operation than he had anticipated in the original bid. Because of this experience, the Contractor was apparently quite reluctant to put forth more than a minimum effort in subsequent work, which included backfilling in critical areas around the utility tunnel and under the vestibule. Many decisions that should have been made at the site or resident office level were referred to the project office in Lincoln for resolution, thus creating awkward contractor relations with the Corps Site and Resident Engineer personnel. Recent policy revisions resulting in initiation of two part change orders have reportedly improved the contractors attitude toward many phases of the work, including backfill operation. At the present time, the backfill work is proceeding in a generally satisfactory manner and good results are being obtained.

5. Area Organization

a. Area Office

The Area Office at Lincoln is organized and staffed in essentially the same manner as reported for the Plattsburgh Area. The primary difference is that a Government area laboratory was not

established at Lincoln and supervision of the commercial laboratory retained for construction control testing of concrete and earthwork materials is assigned to the Construction Branch.

b. Area Laboratory

(1) At the time of initiation of the Atlas F Project at Lincoln, no local Corps of Engineers laboratory was in existence. Because of the short period of time available for mobilization and the relatively small scope of concrete and earthwork operations, a decision was made to utilize the services of a commercial laboratory for construction control testing. Western Laboratory of Lincoln, Nebraska, was awarded a contract to establish and staff field laboratories at each site. Under the terms of the contract, the Omaha District screened and interviewed all site laboratory personnel prior to assignment.

(2) The fact that situations exist in which the use of commercial laboratory services are desirable is not questioned. It must be recognized, however, that certain important disadvantages must be overcome if the operation is to be successful. Where the staff of a Corps laboratory will normally accept and maintain control testing as a basic responsibility, the commercial laboratory must continually be instructed and directed in work assignments. There is often a tendency on the part of construction engineers to assume that construction control testing is proceeding in a satisfactory manner because a commercial laboratory is on the job, without giving necessary attention to the requirement for frequent check-up and direction. This lack of communication can easily lead to a considerable time gap between the development of problems and their recognition and solution. It is

probably more than coincidental that the two ICBM projects visited thus far which have used the services of commercial laboratories have experienced more critical problems in earthwork and compaction operations than any of the other projects.

c. Resident and Site Organization

The construction of the twelve (12) launch Atlas F Squadron at Lincoln is divided among four Resident Engineers each being responsible for three (3) launch facilities. Additionally, a Site Engineer is assigned to each facility. Concrete and earthwork operations are controlled by a staff of three general inspectors at each site.

6. Construction Control

a. Inspection Personnel

In the initial construction involving backfill operations, inspectors were not specifically assigned to earthwork as a full time responsibility. The procedure was revised after development of backfill settlement problems at several sites. At the present time, a qualified inspector is present during all backfill and compaction operations during both day and night shifts.

b. Control Testing

All control testing is accomplished by representatives of Western Laboratory assigned to each site. The laboratory representative worked at a considerable disadvantage since a full-time backfill inspector was not used, and directions were received from several individuals. There are indications that the contractor was attempting to expedite initial back fill operations at several sites in an effort to make up

time lost in shafting. The initial phases of backfill around the utility tunnel and under the vestibule are predominately in critical areas and involve considerable hand compaction. A contractor can be forced to revise faulty operations and remove faulty work on the basis of test results provided the test program is properly applied. Control tests will not detect such situations as excessive lift thickness nor will they detect improperly compacted materials in areas where operations are moving too rapidly to permit proper coverage. The instances of excessive vestibule settlement can only be related to consolidation of improperly compacted fill materials over and around the utility tunnel. Close inspection of moisture content, lift thickness, and compactive effort together with a good testing program could have prevented this difficulty. These operations are being accomplished in the remedial work, as well as in initial construction at the more downstream Lincoln sites and satisfactory results are now being obtained.

c. Site Laboratory Facilities

Western Laboratory has provided all necessary testing equipment at each site to perform gradation tests, water content tests, field density tests, and one point compaction tests for identification of materials.

d. Training

One symposium on backfilling and compaction operations has been held for all general inspectors. Additionally, the materials engineer from the Area Office makes periodic checks of earthwork inspection and testing operations. Future instruction should stress

the important fact of good stock piling operations, including blending of random materials for more effective moisture control at those sites where the overburden excavation includes a variety of material types. Inspectors should also be informed that the broad foot on the Wacker Compactor will only effect good compaction in the clay-type materials when lift thickness is limited to two or three inches and close control of moisture content is maintained.

7. Observations and Evaluations

a. Weather Conditions

The open excavation began in the Spring of 1960, and about 21.7 inches of rain occurred from May through September. Precipitation in October was about 1.5 inches and the total precipitation from November through January was 0.65 inches. The months of May through September are frost free; frozen ground can be expected from November through March.

b. Foundation Materials

The material from the open excavation, which comprised about 90% of the backfill material consisted of loess (uniformly graded silty material deposited in winds following two periods of continental glaciation) at all sites except Number 6 where the loess was only thirty feet deep and the bottom ten feet of the open excavation was made in rock. The loess is of two types. The younger Peorian loess is primarily silt and the underlying Loveland loess has weathered to clay and clayey silts. The organic topsoil is seldom over a few feet in thickness.

c. Groundwater Conditions

The groundwater table was above the level of the open cut excavation at seven of the sites, but no serious difficulties developed in this type of excavation. Groundwater did not cause any difficulties when the silo shafts were located in rock; however, the contractor experienced serious difficulties in nearly every case where silty or granular soils were encountered below the water table.

d. Excavation

The open excavation was accomplished by pans without difficulty. For the silo excavation, front end loaders, clams and hand methods were used in soils. Normal blasting operations were used in rock. No particular difficulties were encountered in rock, but loss of material is reported to have occurred from behind the silo lining in most of the soil sites both above and below the groundwater level.

e. Stockpiling

The material from the open excavation was placed in single stockpiles. Soils from the silo excavation were added to the top of the stockpile and rock was generally wasted offsite. This process could result in the wetter materials being placed on top of the drier materials, which, coupled with the rainfall, could cause the material in the stockpiles to have a moisture content in excess of the optimum. This would be highly undesirable when the contractor was ready to use these materials for compacted backfill.

f. Backfill Materials

The specifications recognize two classes of fill or backfill materials: Type A, a well-graded sand or sandy gravel, and Type B, random excavation materials.

(1) The Type A material used is a well-graded sand with small amounts of gravel. With the exception of minor amounts obtained from the Grand Island Formation in the silo excavation, it had to be imported to all sites and thus its cost is somewhat higher than local site materials. The Type A material compacted readily under the action of vibratory compactors. Appropriate care needs to be exercised to insure that adequate amounts of water are used in compacting this material and to avoid compacting it in a dry or a slightly moist condition, if at all possible.

(2) The Type B materials vary from site to site and also within a given site. These soils were observed to vary from fat clays to silts and sandy silts. Little attempt seemed to have been made to segregate different materials when they occurred at a given site, although this is advantageous for securing proper moisture control for compaction. The clays are not difficult to compact, provided proper moisture control is exercised, and may be compacted by sheepsfoot rollers in open areas and heavy mechanical tampers in confined areas. Extreme care should be exercised in the moisture control of the silty materials as even a slight excess of moisture above the optimum will make them unstable or quick under the action of compacting equipment. The same types of compactors indicated for the clays may also be used on the silty materials.

g. Compaction of Backfill Materials

(1) Initial Construction. Although much of the backfill had been placed prior to the visit of the team, certain inferences may

be made on adequacy of the compaction based on information made available and observations of the team during site visits. The numerous instances of LCC vestibule settlement with no corresponding large movements of the underlying tunnels point to inadequate compaction of the backfill lying between these two structures. This is further verified by inspection of test data and photographs of undisturbed samples of materials taken from these areas by the Omaha District and reported in "Remedial Measures Necessary to Correct Vestibule and Utility Tunnel Settlements", February - March 1961. These data showed zones of below-specification density as well as zones of very loose uncompacted material. The team also observed at Site 11, very soft, wet silts being excavated from the previously compacted backfill overlying the tunnel and beneath the vestibule. Inasmuch as these structures are relatively light and the depth of fill above them is not great, settlements of the magnitudes experienced would not be expected if the underlying fill were compacted to specification densities. All of the evidence points to improper compaction procedures which were probably the result of many factors such as inadequate field inspection, too, the thick lifts, too wet or possibly frozen materials.

(2) Reconstruction. It was apparent to the team that a sincere effort is being made to achieve proper compaction of backfill around the tunnels and vestibules which are in process of being reset to grade, as well as around the structures at sites where initial construction is still in progress. The decision to use Type A material around the tunnels is commendable and the vibratory compactors appeared

to be providing effective compaction on this material. Difficulties still exist in achieving adequate compaction under the haunches of the tunnels and in the area excavated below the invert for fastening the neoprene seals. The use of 2 x 4's and small "pogo sticks" to compact in these confined areas is probably not too effective. The use of a lean mix concrete or grout in these very confined spaces would undoubtedly achieve a better bedding for the tunnels than any method of compaction that could be applied. If desired, the lean mix concrete could be placed a few inches away from the tunnel, and the intervening small space filled with sand rodded in place. Compaction of the Type B backfill from 18 inches above the tunnel up to and around the vestibule appeared to be proceeding in a satisfactory manner. The Barco hand tamper seemed to be achieving effective compaction on clays, as would be expected. The Wacker plate compactor was observed to be operating satisfactorily on silts, but is considered to be too light for effective compaction of fat clays unless very thin lifts (2 to 3 in.) are used. At Site 4, it would appear advantageous to use Type A backfill up to the bottom of the vestibule inasmuch as this material is easy to compact, whereas the stockpiled Type B material appeared to be a mixture of soil types, which would make moisture control difficult. As an over-all comment on current compaction operations, it is the opinion of the team that the most important factor in achieving good compaction is to have constant close inspection in the field.

8. Special Conditions

a. An inspection of the six-inch reinforced concrete silo base slab at Site 7 showed evidence of significant upward deflection in the

central portions. There was ponded water in a 10 to 20 foot wide ring around the circumference. The water was 3 to 4 inches deep at the sides of the silo. Since the sump pump was operating and water was draining from weep holes in the sides of the sump, it is doubtful that the floor heave can be attributed to uplift. The more logical explanation is that the swelling fat clay immediately under the filter material has sufficiently expanded to cause the upward movement of the slab. Since the area is confined and temperature variations are minimal, it is recommended that a thin bonded overlay be employed with sufficient thickness to provide drainage to the sump, and with a minimum 2-inch thickness at the center, using either the Corps acid etch or the epoxy bond procedures.

b. At four sites there is the problem of ground water entering the sight tube and draining into the silo. The actual point of water infiltration is not known, but observation indicates it may occur at welded joints and seams in the pipe. In future installation, particular attention should be given to inspection of the welds for water tightness. Also at several sites difficulties have been experienced in maintaining the alignment of the sight tube within the specified tolerance. The cause of this misalignment appears to be due to poor compaction of the embedding backfill.

c. As mentioned previously a problem can be anticipated at a few sites where the stockpiles for Type B backfill are composed of several material types. Should the Contractor choose to use this material for backfill under the vestibule, a severe work load will be

placed on inspectors and control testing personnel because of variations in optimum moisture requirements for different soil types. The contractor should be directed to blend or process a sufficient quantity of these materials in a separate stockpile to be used as backfill up to the base of the vestibule and under the entry tunnel so that one uniform material will be available. As an alternate, the contractor could be given a choise of using Type A backfill in these areas. One or the other of these procedures should be effected even though the general specifications are not clear on this requirement.

9. Significant Problems

Significant problems encountered at the project were: settlement of the vestibule at the entrance to the launch control center, settlement and deformation of the utility tunnels, settlement of the silo, and settlement of the LCC structure.

a. General:

The vestibule is a reinforced concrete box structure about 14 feet square placed on soil backfill for entry to the top level of the LCC building. It is connected to the LCC structure by means of a free construction joint which permits differential movement between the two. There is six feet of backfill over the vestibule and LCC building. Below the vestibule there is 10 feet of backfill to the top of the 8 foot diameter corrugated multiplate utility tunnel which connects the lower level of the LCC building to the silo. The utility tunnel is 15 feet long. The LCC building is set on natural ground. The utility tunnel has about 2 feet of backfill beneath the central portion. However, where it joins the silo and LCC building, over-excavation can

vary from four feet to as much as 30 feet at the silo. About four feet of over-excavation is necessary at each end to install the flexible neoprene seals on the outside of the tunnel.

b. Vestibule Settlement:

Settlement of the vestibules at seven of the sites was excessive, ranging from 8 to 16 inches following the initial construction. Investigations conducted to date indicate that the greater portion of this settlement resulted from not obtaining the specified density of 90% of the modified AASHO maximum dry weight in the backfill below the vestibules. Reconstruction of the backfill under the vestibule and tunnel at Site No. 1 was successful in nullifying the effects of settlement on the vestibule. At the time of the inspection there was no differential settlement between the vestibule and LCC building at Site 1. The Resident Engineer said that this had been achieved by setting the vestibule one inch above grade. Therefore, about 1 inch of settlement had occurred in the backfill beneath the tunnel at this time.

c. Utility Tunnel Settlement and Deformation:

It was stated that the settlement and deformation of the utility tunnels in no instance was sufficient to rupture the flexible neoprene seals at the juncture to the silo and LCC building. The deformation or shortening of the vertical axis of the tunnel in some cases was as much as three inches and settlement at the invert about one inch. For much of the initial construction the tunnels were set in concrete saddles varying in thickness from 6 inches to 2 feet. Sand bedding was also used for the initial construction. The tunnels

were strutted vertically to maintain them in round while the backfill was being placed to final grade. For reconstruction and after initial experience the utility tunnels were strutted about 1 inch out of round. Reconstruction of the tunnels was generally accomplished when it was considered necessary to reset the vestibule and/or tunnel deformation was excessive. In reconstruction of the tunnels the concrete saddles were removed and replaced with a sand bedding. Further, the select sand backfill was carried to about 18 inches over the crown of the tunnel.

d. Settlement of Silos:

At Sites 7 and 8 it was reported that the silos had settled approximately 1.5 inches, in addition the Site 7 silo was some 0.75 inches out of plumb and the Site 8 silo approximately 0.40 inches. A number of factors could have contributed to this movement of the silos, the principal one being a slight reconsolidation of rebounded material at the base of the silo. Such rebound would be expected at the base of the silo at most soil sites, but settlement would be resisted by side friction. At Sites 7 and 8, the concrete in the silos was placed with outside forms some distance inside the ring beams for a considerable depth below the open cut elevation. Before backfilling the arch between the concrete and the shoring with sand backpacking, a period of time elapsed when no side friction existed. The disturbance of material at the side of the shaft during excavation may also have reduced in some degree the effects of side friction. Other possible factors that could contribute to the movement are the consolidation of unsubmerged materials near the base of the silo which are being dewatered by the sump pump, and

disturbance of the soils at the base of the silo during excavation operations. Further measurements should be made to establish whether or not additional movement is occurring. If additional movement of this type occurs there is cause for concern and a more thorough study of the causes should be made.

e. Settlement of LCC Buildings

At Site 8 the LCC building had settled five inches and at three additional sites settlements of lesser amounts were reported. Possible causes of this settlement may be disturbance of the foundation at the time the base of the LCC building was placed, rebound of the foundation after excavation, lowering of the ground water table during the construction of the silo, and additional weight added in the open excavation by the compacted backfill. If the settlement is due to any or several of the above factors the rate of settlement should decrease to a negligible quantity when backfilling operations are completed. Therefore, periodic measurements should be taken and plotted with respect to time to be sure that the settlement is due to normal consolidation of the foundation soils. If the rate of settlement increases or does not decrease appreciably a more thorough investigation of the possible causes should be made immediately.

10. Conclusions

It is concluded that:

a. Foundation investigations and testing were adequate for classification and general information purposes needed to prepare plans and specifications and needed for general engineering and construction purposes.

b. Specifications and plans were adequate for the general features of the work. However, they were not particularly site adapted, and contained minor discrepancies and lack of clarity concerning some features of the work.

c. Relations between the Government and contractor organizations were awkward at times in the early phases of construction. Recent changes in policy have improved this situation.

d. At the beginning of construction the limitations inherent in the utilization of a commercial laboratory for performing construction control tests of earthwork were not recognized. Consequently, the necessary supervisory controls for the effective direction of the commercial laboratory personnel were not provided.

e. Preliminary planning for the inspection of earthwork construction did not properly recognize the importance of compaction control in critical areas. As a result the proper emphasis was not placed on Government staffing requirements at the sites for exercising proper control of compaction. This deficiency has now been remedied.

f. The excessive settlement of the LCC vestibules and deformation of the utility tunnels is the result of improper backfill compaction. Had the specified compaction been achieved settlements and deformations would have been within tolerable limits.

g. The heave in the silo base slab at Site 7, and settlement of the silos and LCC buildings discussed in the body of the report is not considered cause for concern unless further movements of this nature occur.

11. Recommendations

a. The correction of deficiencies discussed in this report be taken advantage of in the planning, design, and construction of future work of this type.

b. The Area Engineers on ICBM projects establish before construction the critical areas with regard to earthwork and compaction, and give instruction to the field forces on acceptable and unacceptable construction procedures in these areas.

c. Periodic measurements of the settlement and other movements of the silos and LCC buildings be continued, and if these movements persist, immediate studies be made to determine the cause and method of correction.

d. Where silos or LCC structures are being constructed in soils and the water table is high, immediate plans be made for establishing reference points for measuring movements during and after construction. (This recommendation would apply particularly well to Plattsburgh).

MEETING ON CONTRACTOR'S CLAIM FOR
DESIGN DEFICIENCIES WITH CEBMCO & OMAHA DISTRICT PERSONNEL
AND RESULTING DECISIONS

1. On 14 December 1960, a meeting was held in the Lincoln Area Office to discuss the District Office's findings in regard to the Contractor's allegations. Those in attendance as of 0800 were:

Col. W. W. Wilson, CEBMCO, Director, Atlas F
Col. John E. Minahan, Lincoln Area, Area Engineer
Col. John J. Haley, Omaha District, Deputy District Engineer
Lt. Col. C. H. Chamberlain, CEBMCO, Chief, Engineering Division
Lt. Col. Hal L. Schroeder, Lincoln Area, Executive Officer
L. P. Theriault, Lincoln Area, Asst. Area Engineer
L. P. Langdon, Omaha District, Project Coordinator
C. G. Johnson, Omaha District, Asst. Chief, C A Branch
J. O. Ackerman, Omaha District, Chief, Engineering Division
C. J. Kudlacz, Omaha District, Asst. District Counsel
A. H. Bauman, Omaha District, Chief, Struct. Design Section
S. F. Thorfinnson, Omaha District, Consultant
J. D. Wills, Omaha District, F & M Branch
Allan B. Aaron, CEBMCO, Asst. Counsel
Lloyd A. Duscha, Lincoln Area, Chief, E & T Branch
H. D. Anderson, Lincoln Area, Chief, C A Branch
M. A. Dreyling, CEBMCO, C A Branch
D. E. Pond, Lincoln Area, Construction Engineer
G. D. Roberts, CEBMCO, F & M Branch

2. Colonel Wilson opened the meeting by asking the Omaha District personnel to present their overall summation of the review findings and to clarify or explain any particular facets in regard to this review before the meeting with the local SATAF at 1000. Mr. Kudlacz stated that although the contractor had the option of using either metal liner plate or wood lagging during excavation, it was the general consensus of opinion that the wood lagging method used was far more time consuming than the metal liner plate would have been and therefore the time allowed to completion of Item 1 was not sufficient. He further said that this insufficient time allowance could be considered as a design deficiency as time allowance should be considered as a part of design work. Mr. Bauman said that the District had made their analysis on the basis of the actual time taken to complete the excavation using the wood lagging method and then compared this figure with an estimate of the time required had metal liner plate been used. To arrive at the time due the contractor, the actual time for the open

cut and concrete operations was subtracted from the time allowed under the contract for Item 1. The difference between actual and estimated time required for excavation then became the basis for the time allowance. Mr. Aaron asked if the contractor was efficient in his concrete and open cut operations and therefore were the time allowances for these operations reasonable. Mr. Bauman replied that to his knowledge Western Contracting Corporation performed these operations in reasonable time, but that a certain amount of time had been charged to the contractor for various inefficiencies such as dewatering. Mr. Johnson explained that C A Branch had only allowed the contractor time for installing additional ring beams. He stated that the only way the time could be extended under the terms of the contract was due to Changed Conditions, Design Deficiency or Impossible Time Allowance. Under the circumstances, it was felt that none of the above cases apply in this case. The only debatable case would be the Time Allowance, but it was C A Branch's opinion that the time could have been met had satisfactory and adequate methods been used. Mr.Bauman reviewed the consultant's reports wherein Dr. Peck had considered the lagging to be adequate if proper methods were used. The other consultants considered the liner plate to be more expeditious considering the conditions and time allowed. Mr. Ackerman stated that Western Contracting Corporation is claiming deficiencies in the specifications because they were given methods and procedures to be used thereby tying their hands, but as Mr. Roberts said, it was obvious during his inspection tour in September that Western Contracting Corporation was not following the dewatering in regards to specifications and therefore the Government was not entirely to blame for delay as dewatering was the principal cause of excavation problems. Colonel Chamberlain mentioned the fact that the contractor could obtain extra time on the poorer holes by changing the site sequence. He is permitted this option until 10 Jan. and should have used this to his advantage. Mr. Anderson and Mr. Theriault pointed out the fact that although this was permitted by the contract, it was subject to Contracting Officer approval and that two previous proposals had been denied before acceptance of the sequence change that was finally approved on 4 November. Mr. Ackerman asked for the Area's viewpoint and Colonel Schroeder said he felt that the contractor was due some compensation on Sites 4 and 5 on an overall basis, but not specifically for design inadequacy. The contractor applied the same effort to all holes and tried to shift better personnel to the poorer holes, but was hampered by union regulations and inexperienced personnel. From the summation of the discussion held, Colonel Wilson stated it was his understanding that it was the opinion of the District personnel that the Government could not be held liable for inadequate design, therefore the contractor's claim would be denied. The meeting was then briefly adjourned with further discussions on a hole-by-hole basis to be held at 1000.

3. The meeting was reconvened at 1000 with the following additional personnel in attendance:

Colonel Hastings, Offutt/Lincoln SATAF
Major Vantrease, Offutt/Lincoln SATAF
Major Arnold, Offutt/Lincoln SATAF
Mr. Smith, AMB/BMC

4. Colonel Haley opened the meeting by explaining the District's functions in the review of the claims and stated that the Engineering review had been completed on all 8 sites, but recommendation had been completed on only two sites. Colonel Haley then asked Mr. Bauman to go through the review site by site and explain the allegations and comments to the allegations as set forth on the summary sheets.

5. Site 1 - Contractor claims 31 days are due to design deficiencies.

ALLEGATIONS	ENGRG. DIV. COMMENTS
(1) Metal liners could not be used.	Metal liners could have been used. However, contract does not so require.
(2) Specs do not require dewatering.	Specs do require exterior dewatering.
(3) Materials encountered exhibited changed characteristics.	There is no changed condition.
(4) Design contemplated stability of materials.	Design did not guarantee stability.
(5) Contract does not contemplate time consuming special measures or elaboration of basic design.	Methods inherent to wood lagging option chosen.
(6) Contract documents have no provisions for control of soils outside of ring beams.	Control of soils outside of rings can reasonable be taken for granted whether or not specified in detail.
(7) Could not develop lateral pressure on rings.	Lateral pressure could have been achieved if voids were not permitted.
(8) Delays experienced because of inadequacies in basic design.	Delays were due to lack of foresight or experience by contractor.

6. Site 2 - Contractor claims 41 days are due to design deficiencies.

(1) Metal liners could not be used.	Metal liners could have been used. However, contract does not so require.

ALLEGATIONS	ENGRG. DIV. COMMENTS
(2) Changed conditions Elev. 1095 to 1074.	Borings show material as encountered. There are no changed conditions.
(3) Could not contain material in walls of shaft.	Voids were permitted. Therefore, lateral pressures on rings could not be secured.
(4) Special and time consuming methods required.	Methods inherent to wood lagging option chosen.
(5) Surface water was not the major cause of failure of 28 August.	Surface water combined with voids was responsible. Contractor was warned about care of surface water.
(6) Basic design guarantees stability of materials.	Basic design does not guarantee stability. Data on borings must be used.

It was pointed out during the discussion that the contractor had made no claims on this site until after the failure on 28 August and that no action was taken before failure to provide surface drainage even though the contractor had been forewarned.

7. Site 4 - Contractor claims 64 days are due to design deficiencies.

(1) Metal liners could not be used.	Metal liners could have been used. However, contract does not so require.
(2) Exterior dewatering requirements not specifically set forth.	Specs do require exterior dewatering.
(3) Behavior characteristics of materials different than anticipated.	Materials encountered were as shown on borings.
(4) Design contemplated stability of materials.	Design does not guarantee stability.
(5) Tempo of operations reduced.	Methods inherent to wood lagging option chosen.
(6) Special procedures were directed.	Procedures either inherent or directed as a consequence of operation.
(7) Could not develop lateral pressure on rings.	Lateral pressure could have been achieved if voids were not permitted.

ALLEGATIONS	ENGRG. DIV. COMMENTS
(8) Corrective measures required.	Measures required as a consequence of poor operation.
(9) Govt recognized inadequacy by issuing an acceleration order.	Acceleration order not in recognition of design deficiency. Due to closer ring beam spacing.

8. Site 5 - Contractor claims 68 days are due to design deficiencies.

(1) Metal liners could not be used.	Metal liners could have been used however, contract does not so require.
(2) Exterior dewatering requirement not specifically set forth.	Specs do require exterior dewatering.
(3) Behavior characteristics of materials different than anticipated.	Materials encountered were as shown on borings.
(4) Design contemplated stability of materials.	Design does not guarantee stability.
(5) Unstable materials required time consuming measures.	Methods inherent to wood lagging option chosen.
(6) Special procedures were directed.	Procedures either inherent or required as a consequence of operations.
(7) Could not develop lateral pressure on rings.	Lateral pressures could have been developed if voids were not permitted.
(8) Water encountered at Elev. 1250 - not shown.	Borings and daily logs do not show this. Believed to be from lack of control of water from overburden.
(9) Govt was concerned about lack of positive vertical support. Directed installation of needle beams by Mod. 33.	Procedure was requested because of poor procedures. These were not installed.
(10) Delays experienced because of design inadequacy recognized by Govt, in form of acceleration order.	Acceleration order was not in recognition of design deficiency.

During the discussions, it was stated that Western Contracting Corporation started the excavation and lagging by installing wedges behind the lagging next to the face of the excavation thereby providing very little lateral pressure or support. It was also brought out that on 4 June, the Area had directed the use of sheet piling similar to Sites 7 and 8, but that this directive was rescinded by the District Office.

9. Site 7 - Contractor claims 64 days are due to design deficiencies.

ALLEGATIONS	ENGRG. DIV. COMMENTS
(1) Pile section was approved by Corps of Engineers.	Specs indicate section as a minimum. Contractor could have chosen heavier section.
(2) Dewatering plans were approved by Corps of Engineers.	Dewatering plan approved on basis of satisfactory operation.
(3) Changed conditions encountered in installing dewatering wells.	Changed conditions considered insignificant and not a factor in well installation.
(4) Pile lead limited to 3 feet.	Available information indicates lead to be more than 3 feet.
(5) MP 112 Section inadequate.	Section would have been adequate with proper driving procedures.
(6) MP 116 Sections could have been driven successfully.	MP 116 would have required less care. Not needed - no boulders.
(7) Deep wells installed complied with spec requirements.	Wells might have been satisfactory had piling been properly driven. Were inadequate under condition of piling after driving.
(8) Failure of specified piling required drastic change in dewatering.	Failure was the consequence of driving procedures - not from inadequate section.
(9) Design lacked positive vertical support for ring beams.	Failure to drive piles properly resulted in need for special supports.
(10) 12 gage liner plate was too light.	Liner plate adequate for low pressure grout. High pressures used in attempt to make a "seal" that should have been made with sheet piling.
(11) Delays were beyond contractor's control.	Delays entirely due to contractor's inadequate operations.

It was pointed out that the contractor had cut the liner plates to permit the installation of horizontal spiling which resulted in failures under the high pressure grout. Also, the filter material gradation and screen size for the deep wells were inadequate to provide the necessary capacity.

10. Site 8 - Contractor claims 63 days are due to design deficiencies.

(1) File section was approved by Corps of Engineers.	Specs indicate section as a minimum. Contractor could have chosen heavier section.
(2) Dewatering plans were approved by Corps of Engineers.	Dewatering plan approved on basis of satisfactory operation.
(3) Pile lead was limited to 3 feet.	Available info indicates lead to be more than 3 feet.
(4) MP 112 Sections were inadequate.	Section would have been adequate with proper care.
(5) Conference of 21 Aug. reached no decision. Decision not given until 25 August.	Contractor instructed to proceed with Method 3 on 21 August and check progress.
(6) Timeliness requirements not being met.	Contractor's proposed alternate methods also required considerable time.
(7) No recommendation received that would save time and money.	Method selected was determined to be feasible and within limits of plans and specifications.
(8) Procedures directed were a complete departure from plans and specs.	The procedures directed were a consequence of inadequate pile driving.
(9) Materials encountered not shown on logs.	No significant changed condition is apparent.
(10) Were directed to install additional wells and well points.	Direction necessary because of inadequate existing procedures.
(11) Materials encountered at Elev. 1407 with characteristics not compatible with ring beam and liner plate method.	Change made not significant from cost or time standpoint.
(12) Failure of piling necesitated complete change in method.	Failure of piling was a result of poor driving techniques. Change of mining method was a consequence.
(13) Changed conditions encountered affecting dewatering.	No changed condition encountered.

ALLEGATIONS	ENGNG. DIV. COMMENTS
(14) Contract documents constitute an implied warranty of their sufficiency.	Plans and specs do not constitute a warranty of sufficiency except when reasonable used. Improper procedures were cause of difficulty.
(15) Delays encountered beyond contractor's control.	Basic design adequate. No significant changed condition.

It was brought up during the discussion that the contractor failed to follow the approved dewatering plan. Instead of the 24" drilled wells as proposed, the contractor installed 16" jetted wells.

11. Site 10 - Contractor claims 29 days are due to design deficiencies.

(1) Metal liners could not be used.	Metal liners could have been used. However, contract does not so require.
(2) Dewatering plans were approved by the Corps of Engineers.	Dewatering plans were approved subject to satisfactory operation.
(3) Could not develop lateral supports for ring beams.	Voids were permitted. Therefore, lateral pressures on rings could not be secured.
(4) Special mining procedures were required.	Special procedures either inherent or required as a consequence of operation.
(5) Govt recognized inadequacies of design.	Govt directed measures in the interest of safety from observation of contractor's operations.
(6) Design contemplates stability of materials.	Basic design does not guarantee stability. Data on borings must be used.
(7) Basic design was substantially modified.	Basic design was supplemented as a consequence of poor operations.
(8) Contract did not contemplate employment of time consuming methods.	Methods inherent to wood lagging option chosen.

12. Contractor claims 24 days due to design deficiencies.

(1) Metal liners could not be used.	Metal liners could have been used. However, contract does not so require.
(2) Specs did not provide for dewatering.	Specs do require exterior dewatering.
(3) Changed conditions encountered from Elev. 1123 to 1105.	No changed conditions noted.

ALLEGATIONS	ENGRG. DIV COMMENTS
(4) Contract documents did not contemplate time consuming methods.	Methods inherent to wood lagging option chosen.
(5) Design contemplated stability of materials.	Design did not guarantee stability.
(6) Contract documents contained no provisions for control of soils outside of ring beams.	Proper data was shown on borings. Control of soil outside of rings inherent in method used.
(7) Delays occasioned from inadequate design and changed conditions.	Delays due to acts of Contractor.

13. Meeting adjourned at 1700.

U. S. ARMY, CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
[illegible] WEST 96TH STREET
LOS ANGELES 45, CALIFORNIA

MAIL ADDRESS
A. F. UNIT POST OFFICE
LOS ANGELES 45, CALIFORNIA

IN REPLY REFER TO: ENGMA-VE

19 August 1961

SUBJECT: Review of Contract Administration Procedures - Atlas F Squadron, Lincoln AFB

TO: Chief, Lincoln Review Team

1. GENERAL.

a. A team is hereby appointed to review the procedures contemplated for the resolution of unsettled contract modifications and claims on contract DA-25-066-ENG-6186 with Western Contracting Corporation for construction of Atlas F Squadron, Lincoln AFB, Lincoln, Nebraska and the Government estimates prepared therefor.

b. Composition of the team will be as follows:

Colonel Joe A. Clema, Area Engineer, Lowry AFB
Lt Colonel Francis J. Dirkes, Executive Office
Mr. Robert McKenzie, GS-15, Titan II
Mr. John P. Coony, GS-15, Operations Division
Mr. Emil Vuch, GS-14, Office of Counsel

c. Colonel Clema is designated Team Chief. Mr. Coony is designated Recorder.

2. MISSION:

The mission of the team is to determine:

a. The reasonableness of the current procedures being used for settlement of modifications and claims for the Lincoln AFB Atlas F Squadron contracts, including modifications and claims for both construction and supply contracts.

ENGMA-VE 19 August 1961
SUBJECT: Review of Contract Administration Procedures - Atlas F Squadron, Lincoln AFB

b. The reasonableness of current Government estimates covering modifications and claims for both construction and supply contracts for this squadron.

c. Determine a properly substantiated current CWE for the Lincoln Squadron and define any elements that have not been considered.

3. REPORTS:

a. A report of findings and any recommended actions will be submitted to the Commanding Officer, CEEMCO, by 1 September 1961.

b. Interim reports are required only if the review reveals that immediate action can be taken to avoid unwarranted additional obligation or expenditure of Government funds.

T. J. HAYES
Colonel, Corps of Engineers
Commanding

SECTION I

PREFACE

Due to the many factors beyond the control of both the Contracting Officer and the Area Engineer, they have been faced with tremendous obstacles in constructing the twelve Atlas F Sites by the dates required by the Air Force. The incorporation of hundreds of changes in design and construction, has compressed a great volume of contract administration into a relatively short period of time which has resulted in a backlog of estimating and completion of documentation. In order to accomplish completion of the construction to meet the need dates, immediate decisions were required and notices to proceed were issued prior to obtaining cost proposals from the contractor, therefore finalization of negotiations and preparation of formal contract modifications could not be accomplished in the normal manner. The quality of the exceedingly complex construction for operational weapons built rapidly under general peacetime conditions, during a "Cold War" phase, is good. Need dates for incremental completion of the work have been met in all cases. Considering all the factors the Area Engineer has done an excellent job in maintaining construction progress. The costs of concurrency in finalization of design, changes, and construction must be considered in the light of the necessity of providing the completed heavy construction by certain dates in the interest of National Defense.

SECTION II

GENERAL SUMMARY

FINDINGS AND RECOMMENDATIONS

1. Findings.

a. It is determined that the current procedures being used for settlement of modifications and claims for the Lincoln AFB Atlas F construction and supply contracts are satisfactory provided that: (See Tab C for details)

(1) Reasonable estimated cost is utilized, to avoid the aspects of a cost-plus-a-per cent of cost transaction.

(2) Precautions are taken in the use of actual contractor experience by a careful screening to insure that the costs were proper and not unreasonably incurred; the costs were attributable to changes and not the original contract requirements; the costs were not based on excessive charges or inefficiency of the Contractor's planning and management; and allowances do not include costs which could not be recognized in the case of negotiation in advance or in considering a claim.

b. It is determined that the current Government estimates covering modifications and claims for the Lincoln AFB Atlas F project are reasonable. (See Tab D for details)

c. Overhead up to 15 per cent, profit of five per cent and bond of .47 per cent, which are added to the direct costs, are reasonable.

d. The Area has adequate records available, is cognizant of the problems involved and is capable of preparing suitable estimates for negotiating and settling all remaining matters under the contract prior to 1 October 1961.

e. Provisions must be made to safeguard records to support the Government position in the event that modifications and claims are not settled prior to phase out of the Area.

f. It is determined that the CWE for the Lincoln AFB, Atlas F construction contract is properly substantiated. All elements of construction known at this time have been considered. (See Tab E for details)

2. Recommendations. It is recommended that:

a. The current procedures continue to be followed with appropriate precautions to insure elimination of those aspects associated with a cost plus a fixed fee transaction, in settlement of the Atlas F contracts at Lincoln AFB.

b. The current Government estimates as prepared for Site 3 and as being prepared for the other 11 sites and the claims estimates as prepared for Modification 103 and as being prepared for other claims be used as the basis for negotiations.

c. Instructions be issued to insure that proper documentation be on file to support the Government's position taken on any modifications or claims not settled prior to phase out of the Area Office.

d. Instructions be issued to the Area to take action necessary to complete estimates, negotiations and final settlement prior to 1 October 1961.

e. The CWE in the amount of $62,807,190 be approved and the required additional funds immediately obtained.

ANALYSIS OF MISSILE BASE CONSTRUCTION COSTS (IN THOUSANDS) AS OF 28 February 1962

RCS-ENGMA-VC-3

MISSILE BASE PROJECT			COSTS INCURRED BEFORE TAKE OVER										COST INCURRED AFTER TAKE OVER										CUMULATIVE COSTS TO DATE									
TAKE OVER DATE	NAME	BAN	DIRECT CONSTRUCT COSTS	A/E CONTRACT INSP	%	GOVT FORCES I & S & E & D	%	OVERHEAD	%	TOTAL GOVT COSTS	%	DIRECT CONSTRUCT COSTS	A/E CONTRACT INSP	%	GOVT FORCES I & S & E & D	%	OVERHEAD	%	TOTAL GOVT COSTS	%	DIRECT CONSTRUCT COSTS	A/E CONTRACT INSP	%	GOVT FORCES I & S & E & D	%	OVERHEAD	%	TOTAL GOVT COSTS	%
ATLAS F																																
1 Nov 60	Schilling	485	19,793	127	0.6	957	4.8	484	2.5	1,568	7.9	(4,250) 37,416	449	1.2	1,880	5.0	393	1.1	2,722	7.3	(4,250) 57,209	576	1.0	2,837	5.0	877	1.5	4,290	7.5
1 Nov 60	Lincoln	481	(374) 12,680	66	0.5	953	7.5	148	1.2	1,167	9.2	(2,605) 47,108	423	0.9	2,100	4.5	494	1.0	3,019	6.4	(2,979) 59,788	491	0.8	3,053	5.1	642	1.1	4,186	7.0
1 Dec 60	Altus	470	12,899	109	0.8	908	7.0	433	3.4	1,450	11.2	(4,249) 38,177	133	0.3	(2) 1,854	4.9	401	1.1	2,388	6.3	(4,249) 51,076	242	0.5	(2) 2,762	5.4	834	1.6	3,838	7.5
1 Dec 60	Dyess	471	9,230	25	0.3	800	8.7	354	3.8	1,179	12.8	(4,675) 29,568	100	0.3	1,709	5.8	310	1.1	2,119	7.2	(4,675) 38,798	125	0.3	2,509	6.5	664	1.7	3,298	8.5
1 Dec 60	Walker	473	4,420	63	1.4	658	14.9	256	5.8	977	22.1	(4,258) 36,028	68	0.2	(1) 2,202	6.1	381	1.0	2,651	7.3	(4,258) 40,448	131	0.3	(1) 2,860	7.1	637	1.6	3,628	9.0
1 Oct 60	Plattsburgh	472	2,905	-0-	0.0	342	11.8	136	4.6	478	16.4	(4,255) 42,340	229	0.5	2,803	6.6	451	1.1	3,483	8.2	(4,255) 45,245	229	0.5	3,145	7.0	587	1.3	3,961	8.8
TOTAL ATLAS F			(374) 61,927	390	0.6	4,618	7.5	1,811	2.9	6,819	11.0	(24,292) 230,637	1,404	0.6	(3) 12,548	5.4	2,430	1.1	16,382	7.1	(24,666) 292,564	1,794	0.6	(3) 17,166	5.9	4,241	1.4	23,201	7.9

FOR OFFICIAL USE ONLY

PROGRAM SUMMARY SHEET
($000,000)

MISSILE BASE Lincoln AS OF 31 January 1962

		Current CCE
1.	Basic Constr. Cost	$ 36.0
2.	Land	0.3
3.	Utility Connections	0.0004
4.	Mods (Negot)	18.0
5.	Changes Issued	0.0
6.	Claims Settled	3.4
7.	Claims Validated	0.0
8.	Unawarded Work	1.2
9.	Contingencies	0.0
10.	Government Cost	4.5
	Total CCE	$ 63.4
11.	Potential Claims	0.0
	Total	$ 63.4

FOR OFFICIAL USE ONLY

NOTE: An overall allowance for unforeseen work will be programmed by Weapon System.

ATLAS "F"
LINCOLN

31 January 1962

SUMMARY

1.	Basic Construction Cost (See TAB 1)	$35,954,554
2.	Land (See TAB 2)	297,859
3.	Utility Connections (See TAB 3)	300
4.	Mods (Negotiated) (See TAB 4)	17,995,220
5.	Changes Issued But Not Negotiated (See TAB 5)	10,000
6.	Claims Settled (See TAB 6)	3,413,467
7.	Claims Validated (Unsettled) (See TAB 7)	0
8.	Unawarded Work (See TAB 8)	1,170,000
9.	Contingencies (See TAB 9)	50,000
10.	Government Cost (See TAB 10)	4,500,000
	TOTAL CCE	$63,391,480

NOTE: An overall allowance for unforeseen work will be programmed by Weapon System.

TAB 1

ATLAS "F"
LINCOLN

31 January 1962

BASIC CONSTRUCTION COSTS

a. Construction Contracts

6186	Missile Launch Complexes	$17,400,000	
	3 Additional Complexes	6,613,000	
	Water Supply (Mod 58)	800,000	
	3 Site Addns to Water Supply	265,000	
			$25,078,000
6221	LOX Facility	388,913*	
6328	Re-Entry Vehicle Facility	127,803*	
6386	Missile Assy Building	1,020,012*	
6997	Safety Platforms	66,855	
7056	Fuel Catchment System	189,720	
5160	GOX Vent Sleeves	59,450	
7682	Repairs to Silo 7 Floor Slab	238,000	
5229	Install 42" Mod Kit	30,805	$ 2,121,558

b. Assigned Service Contracts

	Assignment PLS Part 3	$ 1,323,105	
4240	Elevators	342,107.10	
4247	Switchgear Panels	142,800.00	
4264	Diesel Generators	995,169.66	
4326	Blast Closures	137,805.33	
4334	Air Cylinder Spring Supports	85,320.00	
4341	Door Hinge Assy	238,932.00	
5712	Water Chiller & Rotary Pumps	106,728.00	
5719	Cooling Towers	43,308.00	
5726	Cent. & Turbine Pumps	52,131.06	
5733	Sewage Pumps	9,168.00	
5740	Submersible Pumps	20,400.00	
5747	Air Washer & Dust Coll. Units	130,962.00	
5754	Fan Coil Units	37,260.00	
5784	Cent. Fans	27,069.60	
5791	Axial Flow Fans	27,240.00	
5798	Propeller Type Fans	2,640.00	
			3,722,146
	Bond Premium Adjustment	- 103.21	
	Mark-up Adjustment	- 2,745.03	- 2,848
			$ 3,719,298

* Final price

c. Procurement

5761	PLS Part 1 & 2	$ 3,828,166**	
4439	CBR Filters	6,681	
6062	A/C Fan Coil Units	6,177	
6063	Water Booster Pumps	1,042	
6070	Missile Inclosure	71,111	
6097	GOX Vent Fans	12,912	
4964	GOX Blast Closure	42,963	
	Reimburse P-313 (Water Wells)	40,248	
5862	San Fran (Blast Det Sys)	189,372	
7378	Gaseous Helium N_2 Trailers	72,701	
7379	LN_2 Trailers & Charger	27,255	
7430	LN_2 Rechargers	66,384	
6172	LN_2 Rechargers	54,635	
7634, 7383, 7387		579	
7496	Air Intake Damper (POD)	5,063	
5173	42" Blast Closure	13,610	
7486	Boilers (POD))		
7485	Duct Heaters (POD))	47,048	
7487	Switchgear (POD))		
			$ 4,485,947

d. Government Furnished Materials — 37,308

e. Overruns (Additional Bracing Ring Beams) — 8,889

f. Sub-Allotments

WES (Vicksburg)	$ 62,000	
Omaha (UTL &Consult)	22,000	
Kansas City (I&A on ASC)	98,335	
Ft Worth (Missile Inclosures)	3,687	
Ft Worth (PLS Insp)	150,000	
Ft Worth (GOX)	4,000	
Ft Worth (I&A Spec Equip)	32,000	
San Fran (I&A Blast Det Sys)	6,532	
Misc Inspection Requisitions	25,000	
		$ 503,554

TOTAL — $35,954,554

** See TAB 1a

TAB 1a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-5761

	PROCUREMENT	ASSIGNED PART	TOTAL
Basic Contract	$1,511,847.00	$ 253,404.00	$1,765,251.00
Mods (Negotiated)	2,278,464.33	1,069,701.36	3,348,165.69
Changes Issued	37,854.28	295,800.00	333,645.28
Contingencies	0	0	0
TOTAL	$3,828,165.61	$1,618,905.36	$5,447,070.97
Less Assigned Claim (See TAB 6a)		295,800.00	295,800.00
	$3,828,165.61	$1,323,105.36	$5,151,270.97

TAB 2

ATLAS "F"
LINCOLN

31 January 1962

LAND

00-007	Land Fee Pur	$ 12,859
00-008	Land Easement	285,000
	TOTAL	$297,859

Above amounts do not include possible requirements for azimuth marker site.

TAB 3

ATLAS "F"
LINCOLN

31 January 1962

UTILITY CONNECTIONS

Utility Connections	$ 380

TAB 4

ATLAS "F"

LINCOLN

31 January 1962

MODS NEGOTIATED

SUMMARY

Over $100,000 (See TAB 4a)

	Contr Prop	Negotiated Amount
Mod 3	$ 1,597,577	$ 638,400
Mod 4	1,281,332	613,800
Mod 6	1,740,303	553,000
Mod 17	5,374,658	1,170,000
Mod 32	2,292,925	894,000
Mod 35	1,380,630	517,386
Mod 102	24,000,000*	16,342,232
Mod 57	446,845	265,000
Mod 58	800,000	415,000
SUBTOTAL	$38,914,270	$21,407,818
Under $100,000 (See TAB 4b)	834,961	770,069
TOTAL	$39,749,231	$22,177,887
Less Water Supply (TAB 1)		1,065,000
Less Claims (TAB 6)		3,117,667
		$17,995,220

*Estimated the contractor's proposal of $29,839,441 was broader in scope than was settled in Mod 102. Items ultimately dealt with separately were not identified separately in the proposal.

**Included in proposal (estimated) for Mod 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. da-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 3

1. Source of Change: Air Force Directive COC 157
2. Date: 11 April 1960
3. Received by Contracting Officer: 28 April 1960
4. Presented to Contractor: 3 May 1960
5. Status of Negotiations: Settled in Mod. 102
6. Notice to Proceed: 6 June 1960
7. Contractor's Proposal: $1,597,577
8. Amount: $638,400 (Interim)
9. Remarks:

Revise crib steel, tension equalizers, door appurtenances; relocate cabinet and junction boxes.

Adjustment of payment is provided in Mod. 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 4

1. Source of Change: Air Force Directive COC 168

2. Date: 11 April 1960

3. Received by Contracting Officer: 5 May 1960

4. Presented to Contractor: 6 May 1960

5. Status of Negotiations: Settled in Mod. 102

6. Notice to Proceed: 6 June 1960

7. Contractor's Proposal: $1,281,332

8. Amount: $613,800 (Interim)

9. Remarks:

Revised silo crib and interfaces structural changes to blast closures. Revise process vessels.

Adjustment of payment is provided in Mod. 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 6

1. Source of Change: Air Force Directive COC 181, 194, 204
2. Date: 20 April 1960
3. Received by Contracting Officer: 5 May 1960
4. Presented to Contractor: 7 June 1960
5. Status of Negotiations: Settled in Mod. 102
6. Notice to Proceed: 16 June 1960
7. Contractor's Proposal: $1,740,303
8. Amount: $552,000 (Interim)
9. Remarks:

   Change structural steel crib mechanical and electrical systems.

   Adjustment of payment is provided in Mod. 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 17

1. Source of Change: Air Force Directive COC 227, 343, 369, 286, 382A, 397, 234B, 261B and 279B

2. Date: 13 June 1960

3. Received by Contracting Officer: 20 September 1960

4. Presented to Contractor: 20 September 1960

5. Status of Negotiations: Settled in Mod. 102

6. Notice to Proceed: 20 September 1960

7. Contractor's Proposal: $5,374,658

8. Amount: $1,170,000 (Interim)

9. Remarks:

Miscellaneous corrections, revisions to structural, electrical and mechanical.

Adjustment of payment is provided in Mod. 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 32

1. Source of Change: Air Force Directive
2. Date: 2 August 1960
3. Received by Contracting Officer: 5 August 1960
4. Presented to Contractor: 5 August 1960
5. Status of Negotiations: Settled in Mod. 102
6. Notice to Proceed: 5 August 1960
7. Contractor's Proposal: $2,292,925
8. Amount: $894,000 (Interim)
9. Remarks:

Revise and substitute supplemental crib steel design drawings for contract drawings.

Adjustment of payment is provided in Mod. 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 35

1. Source of Change: Corps of Engineers

2. Date: 1 August 1960

3. Received by Contracting Officer: N/A

4. Presented to Contractor: N/A

5. Status of Negotiations: Settled in Mod. 102

6. Notice to Proceed: 8 August 1960

7. Contractor's Initial Proposal and Date Thereof: $1,380,630
5 August 1960

8. Negotiated Amount: $517,386 (Unilateral)

9. Remarks:

Time extension on Milestones 1 and 2 and acceleration to overcome excusable delays to meet subsequent milestones and end date. Unilateral modification for $517,386 was issued to allocate additional time, to specify time to be recovered by acceleration and to provide payment for acceleration costs. Modification protested by contractor; latest proposal is $7,052,571.

Additional payment is provided in Mod. No. 102. $2,320,000 of the Government estimate for Mod. No. 102 is attributable to acceleration and concurrent operations resulting from this modification and classified as claims.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 57

1. Source of Change: Air Force Directive COC 232
2. Date: 18 October 1960
3. Received by Contracting Officer: 28 October 1960
4. Presented to Contractor: 2 November 1960
5. Status of Negotiations: Completed
6. Notice to Proceed: 29 November 1960
7. Contractor's Proposal: $446,845
8. Negotiated Amount: $265,000
9. Remarks:

   Changes to Water Supply Facilities, Sites 10, 11 and 12.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-23-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 58

1. Source of Change: Air Force Directive
2. Date: 19 October 1960
3. Received by Contracting Officer: 26 November 1960
4. Presented to Contractor: 12 December 1960
5. Status of Negotiations: Settled in Mod. 102
6. Notice to Proceed: 12 December 1960
7. Contractor's Proposal: $800,000
8. Amount: $415,000 (Interim)
9. Remarks:

   Provide for Water Treatment Plants.

   Adjustment of payment is provided in Mod. 102.

TAB 4a

ATLAS "F"
LINCOLN

31 January 1962

CONTRACT NO. DA-25-066-ENG-6186
WESTERN CONTRACTING CORPORATION

MODIFICATION NO. 102

TOTAL SETTLEMENT LESS MOD. 35	$20,958,136
INTERIM AMOUNT INCLUDED IN MODS	4,615,904
AMOUNT CHANGES IN MOD. NO. 102	$16,342,232

This modification provided for settlement of all unsettled modifications.

TAB 4b

ATLAS "F"

LINCOLN

31 January 1962

MODIFICATIONS NEGOTIATED (UNDER $100,000)

Contract 6186	Contractor's Proposal	Negotiated Amount
Mod No. 1	$ 18,505	$ 18,505
Mod No. 2	13,122	13,122
Mod No. 5	42,047	38,687
Mod No. 13	51,600	51,600
Mod No. 14	9,240	9,240
Mod No. 16	33,336	33,336
Mod No. 18	100,075	67,500
Mod No. 23	68,400	68,400
Mod No. 25	17,400	17,400
Mod No. 33	443	400
Mod No. 36	3,867	2,500
Mod No. 39	36,797	36,797
Mod No. 108	8,112	8,900
Mod No. 112	74,715	74,715
Mod No. 41	600	600
Mod No. 42	66,000	66,000
Mod No. 47	4,036	2,400
Mod No. 49	61,372	54,800
Mod No. 50	9,040	7,500
Mod No. 51	4,274	3,153
Mod No. 55	9,240	9,240
Mod No. 56	67,166	67,166
Mod No. 59	11,873	1,800
Mod No. 61	2,546	2,300
Mod No. 62	1,783	1,783
Mod No. 64	1,678	2,400
Mod No. 68	35,400	35,400
Mod No. 71	5,246	3,125
Mod No. 73	5,150	5,150
Mod No. 74	18,000	18,000
Mod No. 75	15,900	15,900
Mod No. 76	1,884	1,050
Mod No. 81	10,914	6,000
Mod No. 94	25,200	25,200
TOTAL	$834,961	$770,069

TAB 5

ATLAS "F"
LINCOLN

31 January 1962

CHANGES ISSUED BUT NOT NEGOTIATED

RECAPITULATION

Over $100,000	None	0
Under $100,000 (See TAB 5b)		$10,000
	TOTAL	$10,000

TAB 5b

ATLAS "F"

LINCOLN 31 January 1962

CHANGES ISSUED BUT NOT NEGOTIATED (UNDER $100,000)

Contract	Description	Contractor's Proposal	Estimated Settlement
7056	Fuel Catchment System	$13,179	$10,000

TAB 6

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

RECAPITULATION

Over $100,000 (See TAB 6a)

Claim No.	Description	Amount Claimed	Amount Settled
C-36	Electric Power for Testing	$ 100,000*	$ 80,000
C-1	Changed Condition, Site 1	232,225	177,497
C-2	Changed Condition, Site 2	326,024	215,278
C-3	Changed Condition, Site 4	545,368	445,767
C-4	Changed Condition, Site 5	477,859	296,474
C-5	Changed Condition, Site 7	559,577	537,611
C-6	Changed Condition, Site 6	896,129	252,280
C-14 & 21	Vessel Delays	266,199	148,619
C-29	Changed Condition, Site 8	842,413	310,087
C-7	Changed Condition, Site 10	361,070	197,659
C-8	Changed Condition, Site 12	97,773	67,713
C-15	Delay of LOX Tanks	100,000	112,962
	Hardeman Changed Conditions	350,000	295,800
		$5,154,637	$3,137,747
Under $100,000 (See TAB 6b)		2,159,021	275,720
	TOTAL	$7,313,658	$3,413,467

*Included in total proposal. Not specified separately.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-36)
4. Source: Prime Contractor
5. Date: 3 June 61
6. Received by Contracting Officer: 3 January 1961
7. Negotiations Completed: October 61
8. Contractor's Value of Claim: $100,000
9. Settlement Costs: $80,000
   (Included in Mod. 102)
10. Remarks:

Claim alleged that furnishing of electricity for testing for propellant loading system and facility elevator was not required by the specifications.

TAB 6c

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-1)
4. Source: Prime Contractor
5. Date: 18 November 1960
6. Received by Contracting Officer: 18 November 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $232,224.76
9. Settlement Cost: $177,497
10. Remarks:

Claim alleges changed conditions and design inadequacy in the shaft excavation phase at Site 1. Claim submitted on 18 November 1960. Adverse Contracting Officer's Decision dated 30 January 1961. Decision protested. Contracting Officer agreed to reconsider at meeting on 29 March 1961. Contractor withheld submittal of detailed back-up for his protest pending Contracting Officer's response to similar back-up data on Site 5. Back-up information submitted to Area Engineer 30 August 1961.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-2)
4. Source: Prime Contractor
5. Date: 18 November 1960
6. Received by Contracting Officer: 18 November 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $326,023.59
9. Settlement Costs: $215,278
10. Remarks:

Claim alleges changed conditions and design inadequacy in the shaft excavation phase at Site 2. Claim submitted on 18 November 1960. Adverse Contracting Officer's Decision dated 30 January 1961. Decision protested. Contracting Officer agreed to reconsider at meeting on 29 March 1961. Contractor withheld submittal of detailed back-up for his protest pending Contracting Officer's response to similar back-up data on Site 5.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-3)
4. Source: Prime Contractor
5. Date: 18 November 1960
6. Received by Contracting Officer: 18 November 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $545,367.82
9. Settlement Costs: $445,767
10. Remarks:

Claim alleges changed conditions and design inadequacy in the shaft excavation phase at Site 4. Claim submitted on 18 November 1960. Adverse Contracting Officer's Decision dated 30 January 1961. Decision protested. Contracting Officer agreed to reconsider at meeting on 29 March 1961. Contractor withheld submittal of detailed back-up for his protest pending Contracting Officer's response to similar back-up data on Site 5.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-4)
4. Source: Prime Contractor
5. Date: 18 November 1961
6. Received by Contracting Officer: 18 November 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $477,859.06
9. Settlement Costs: $296,474
10. Remarks:

Claim alleges changed conditions and design inadequacy in the shaft excavation phase at Site 5. Claim submitted on 18 November 1960. Adverse Contracting Officer's Decision dated 30 January 1961. Decision protested. Contracting Officer agreed to reconsider at meeting on 29 March 1961. Contractor submitted detailed claim presentation on 24 May 1961. On 14 August 1961, the Contracting Officer advised the Contractor that the claim has merit and requested the Contractor negotiate with the Area Engineer.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-5)
4. Source: Prime Contractor
5. Date: 18 November 1960
6. Received by Contracting Officer: 18 November 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $559,577.23
9. Settlement Costs: $537,611
10. Remarks:

Claim alleges changed conditions and design inadequacy in the shaft excavation phase at Site 7. Claim submitted on 18 November 1960. Adverse Contracting Officer's Decision dated 3 February 1961. Decision protested. Contracting Officer agreed to reconsider at meeting on 29 March 1961.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-6)
4. Source: Prime Contractor
5. Date: 18 November 1960
6. Received by Contracting Officer: 18 November 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $896,128.74
9. Settlement Costs: $252,280
10. Remarks:

Claim alleges changed conditions and design inadequacy in the shaft excavation phase at Site 8. Claim submitted on 18 November 1960. Adverse Contracting Officer's Decision dated 3 February 1961. Decision protested. Contracting Officer agreed to reconsider at meeting on 29 March 1961. Contractor submitted detailed claim presentation on 24 May 1961. Area Engineer's review and recommendations forwarded to the Contracting Officer for determination of extent of Government liability.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claims C-14 & C-21)
4. Source: Subcontractor - Chicago Bridge and Iron Company
5. Date: 13 October 1960
6. Received by Contracting Officer:
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $266,199.15
9. Settlement Costs: $148,619
10. Remarks:

Claim alleges excusable delays caused by late approval of shop drawings and a design deficiency for specifying pickling of Thinwall 304 Stainless Steel Tubing. Shop drawing delay claim was submitted on 5 January 1961. The Area Engineer requested evaluation from the Chicago District. Chicago District advised that Chicago Bridge and Iron Company was preparing additional submittal to include stainless steel problem. This submittal subsequently presented on 19 June 1961.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No.: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No.: 102 (Claim C-29)
4. Source: Prime Contractor
5. Date: 3 January 1961
6. Received by Contracting Officer: 6 February 1961
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $842,413.48
9. Settlement Costs: $310,087
10. Remarks:

Claim alleged changed conditions and design inadequacy in the shaft excavation phase in the lower reaches at Site 8.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No: 102 (Claim C-7)
4. Source: Prime Contractor
5. Date: 16 November 1960
6. Received by Contracting Officer:
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $361,070
9. Settlement Cost: $197,659
10. Remarks:

Changed Condition and Design Deficiency, Site 10.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962.

CLAIMS SETTLED

1. Contract No: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No: 102 (Claim C-8)
4. Source: Prime Contractor
5. Date: 18 November 1960
6. Received by Contracting Officer:
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $97,773
9. Settlement Cost: $ 67,713
10. Remarks:

Changed Condition and Design Deficiency, Site 12.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No: 102 (Claim C-15)
4. Source: Subcontractor - Southwest Welding
5. Date: 9 August 1960
6. Received by Contracting Officer:
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $100,000
9. Settlement Cost: $112,962
10. Remarks:

Delay in fabrication of LOX tanks.

TAB 6a

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED

1. Contract No: DA-25-066-ENG-6186
2. Contractor: Western Contracting Corporation
3. Modification No: 92
4. Source: Paul Hardeman (Subcontractor)
5. Date: 18 December 1960
6. Received by Contracting Officer: 21 December 1960
7. Negotiations Completed: October 1961
8. Contractor's Value of Claim: $350,000
9. Settlement Cost: $295,800
10. Remarks:

Paul Hardeman has claimed additional cost incurred due to the fact that the Launch Complexes were not in the status of construction as stated in the contract. Ft. Worth denied the claim on 22 March 1961, but the Board of Contract Appeals remanded the matter to the Contracting Officer on 12 June 1961, for negotiation of an equitable settlement.

TAB 6b

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS SETTLED (Under $100,000)

Contract No. 6186

Claim No.	Description	Amount Claimed	Amount Settled
C-50	Elevator Installation	$ 46,861	$ 38,295
C-54	Field trim floor plate opening in L.C.C.	1,200*	1,200
C-19	Modify doors of switch gear	54,800*	54,800
C-22	Change in painting specifications	58,893	50,000
C-25	Installation of off-site cables	500*	500
C-26	Drawing conflicts	1,800*	1,800
C-27	Tolerance Req - Collimator Plate	389,310	20,000
C-28	Man-Cage claim	1,520,676	70,000
C-34	Relocate lighting panel	2,400*	2,400
C-46	Reconstruct CBR filter housing	5,803	5,000
C-47	Misfits of floor & crib steel	1,200*	1,200
C-53	Discharge lines and wiers	5,500*	5,500
C-55	Crib steel discrepancies	1,200*	1,200
C-57	Mod. of PLS brackets	68,878	23,825
	TOTAL	$2,159,021	$ 275,720

*Included in contractor's total proposal. Not specified separately.

TAB 7

ATLAS "F"
LINCOLN

31 January 1962

CLAIMS VALIDATED (Unsettled)

NONE

TAB 8

ATLAS "F"
LINCOLN

15 February 1962

UNAWARDED WORK

Azimuth Markers	$ 35,000	
Blast Doors	420,000	
		$ 455,000

POTENTIAL NEW WORK

Site Drainage and Erosion Control	$ 50,000	
UHF/HF/SSB Hardened Antenna Facilities	390,000	
Repairs to Broken Conduit for Blast Detection System	75,000	
Unknown Future Changes	200,000	
		715,000
		$1,170,000

TAB 9

ATLAS "F"
LINCOLN

31 January 1962

CONTINGENCIES

General Contingency	$ 50,000

TAB 10

ATLAS "F"

LINCOLN

31 January 1962

GOVERNMENT COSTS

		C.W.E.	Cost to Date 1/31	Balance to Complete
800.211	A/E Contracts	$ 650,000	$ 609,172	$ 40,828
802.1	Area Office	2,550,000	2,452,271	97,729
802.2	Dist & Directorate	600,000	538,943	61,057
802	Dist & CEEMCO O/H	700,000	650,464	49,536
		$4,500,000	$4,250,850	$ 249,150

1. Balance to complete A/E contracts represents unearned portion as of the date indicated.

2. Balance to complete for Area Office based on previous cost experience and scheduled phase-out to close out Area Office in March 1962.

3. Directorate and CEEMCO overhead costs to completion represent pro-rata share of costs as applicable to this project. Direct cost incurred is used as a basis for distribution.

4. A/E Contracts include contract for construction estimators.

NOTE: Any new contracts where completion dates extend beyond the close-out date indicated would require additional S&I funds.

TAB 11

ATLAS "F"
LINCOLN

31 January 1962

POTENTIAL CLAIMS

NONE

U. S. ARMY, CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
9610 BELLANCA AVENUE
LOS ANGELES 45, CALIFORNIA

MAIL ADDRESS
A. F. UNIT POST OFFICE
LOS ANGELES 45, CALIFORNIA

IN REPLY REFER TO:
ENGMA-AB-2

24 October 1960

SUBJECT: Authority of Contracting Officer's Representative

TO: Area Engineer
U. S. Army Engineer Area (Lincoln)
P. O. Box 1744
Lincoln, Nebraska

Inclosed is a check list showing the authority to be exercised by the Contracting Officer and the Contracting Officer's Representative under the provisions of the contracts for which you will be designated a Contracting Officer's Representative.

W. W. WILSON
Colonel, Corps of Engineers
Contracting Officer and Acting Director
Atlas F Construction Directorate

1 Incl
List of COR auth

Copy furnished:
Dist Engr, Omaha

		INIT.	DATE
3	A E		
1	A E		
2	A O		
4	I H		
	LOAS		
	I & I		
5	CA		
	PLS		
	P & R		
6	O of C		
7	ADM		
	L.RES		

AUTHORITY OF CONTRACTING OFFICER'S REPRESENTATIVE

CONTRACT CLAUSES	Contracting Officer's Representative	Contracting Officer
Specifications and Drawings		
Make written determinations in case of difference in figures, in the drawings, or in the specifications		
a. Obvious errors of minor nature	x	
b. Design changes or correction of significant errors		
(1) Up to $500,000	x	
(2) In excess of $500,000		x
Changes		
a. Negotiation of price and time adjustments up to $ unlimited monetary value	x	
b. Execution of modifications covering field changes:		
(1) Up to $500,000	x	
(2) In excess of $500,000		x
c. Ascertain extent of delay and make recommendations	x	
d. Grant extensions of time after securing approval of CO	x	
Changed Conditions		
a. Receive notice in writing before conditions are disturbed	x	
b. Investigate alleged changed conditions and make recommendation	x	
c. Claims where notice not given before conditions disturbed		
(1) Make recommendations	x	
(2) Make decision all Changed Conditions		x
d. Modify Contract		
(1) Up to $500,000	x	
(2) In excess of $500,000		x
Termination for Default - Damages for Delay - Time Extensions		
a. Make recommendation for termination for default	x	
b. Written notice terminating contractor's right to proceed		x
c. Receive notice of delay within 10 days from the beginning thereof	x	
d. Extend time for receiving notice of delay		x
e. Ascertain facts and extent of delay and make recommendation	x	
f. Grant extensions of time		x
g. Make Findings of Fact (based on recommendation of C.O.R.)		x

CONTRACT CLAUSES	Contracting Officer's Representative	Contracting Officer
Acceleration (Buy back time)		
a. Recommendation	x	
b. Approval		x
c. Issuance of acceleration change order	x	
d. Negotiation of price	x	
e. Execution of change order		x
Disputes		
a. Settle by mutual agreement if appropriate and possible	x	
b. Forward recommendation and all facts fully documented to Contracting Officer	x	
c. Make written decisions concerning disputes		x
d. Send decision to Contractor		x
Payments to Contractors		
a. Determine if partial payments shall be more frequent than once a month	x	
b. Approve payment estimates and certify	x	
c. Determine if satisfactory progress is being made so that remaining progress payments may be made in full after work 50% completed	x	
d. Recommend release of excess retained percentages upon substantial completion of work, except the retainage shall not be reduced below $10,000.00 or 5% of the contract amount, whichever is less, until preparation and processing of the final payment estimate	x	
e. Determine if release of claims from contractor or assignee is to be required		x
f. Determine if value of materials delivered to site shall be taken into consideration in partial payment estimates	x	
g. Recommendation as to where preparatory work at site shall be taken into consideration in partial payment estimates (where there is no "Payment for Preparatory Work" clause in Special Conditions)	x	
h. Determination as to preparatory work		x
Materials and Workmanship		
a. Determination that materials and workmanship meet requirements	x	
b. Request samples (if necessary)	x	
c. Approval of materials and/or equipment	x	
d. Require removal of undesirable employees (other than contractor's key employees) (See General Condition Clause in specifications)	x	

CONTRACT CLAUSES	Contracting Officer's Representative	Contracting Officer
Inspection		
a. Require inspection, examination and testing	x	
b. Reject defective material or workmanship or require its correction	x	
c. Direct removal of rejected materials	x	
d. Determine whether defective work shall be corrected by Government forces or another contractor		x
e. Terminate contractor's right to proceed for non-compliance with this clause		x
f. Order facilities, labor and materials necessary for inspection and testing	x	
g. Order removal or tearing out of completed work for purpose of inspection if necessary to determine compliance	x	
h. Determination of conformance	x	
i. Recommendation that extra payment and extension of time are required	x	
j. Issuance of modification covering extra payment, if necessary, after approval of the Contracting Officer on any time adjustment	x	
Superintendence by Contractor		
a. Require that contractor give personal superintendence to work or have a satisfactory representative on the job with authority to act for him	x	
b. Recommend removal of contractor's representative if unsatisfactory	x	
c. Order removal of contractor's representative		x
Other Contracts		
Issues directions for coordination of work with that of other contractors	x	
Buy American Act		
a. Determine that contractor does not use foreign materials other than contained in list of exceptions	x	
b. Report violations to Contracting Officer	x	
Nondiscrimination in Employment		
a. Determination of compliance with anti-discrimination laws	x	
b. Require that nondiscrimination posters be prominently displayed	x	
c. Report any violations to Labor Compliance Officer	x	

CONTRACT CLAUSES	Contracting Officer's Representative	Contracting Officer
Davis-Bacon Act		
a. Require contractor and subcontractors to use proper classifications and to pay minimum wages as prescribed	x	
b. Require minimum wa ge rates be prominently displayed at the site of the work	x	
c. Make prompt report of violations that cannot be promptly adjusted	x	
Eight-Hour Laws - Overtime Compensation		
a. Require contractors and subcontractors pay at least one and one-half times basic rate of pay for work in excess of 8 hours in any one day	x	
b. Make immediate report of violations that cannot be promptly adjusted	x	
c. Recommend penalties for violation	x	
d. Assess penalties		x
Apprentices		
Determine that apprentices are properly indentured and registered as required and if not require contractor and/or subcontractor to pay difference between apprentice and journeyman rate	x	
Payroll Records and Payrolls		
a. Require contractors and subcontractors to maintain payroll records	x	
b. Forward properly certified copies of all payrolls to the Contracting Officer weekly after checking for proper compliance	x	
Copeland (Anti-Kickback) Act - Nonrebate of Wages		
a. Require that statement of compliance be attached to each copy of payrolls submitted by prime or subcontractors	x	
b. Report any violations of the terms of the Act	x	
Withholding of Funds to Insure Payment of Wages		
a. Recommendation that funds be withheld for violation of contract labor provisions	x	
b. Determination for withholding of funds		x
Notice to Government of Labor Disputes		
Require contractors or subcontractors to give prompt notice of any labor disputes	x	
Government-Furnished Property		
a. Make findings of delay to work caused by late delivery of Government-furnished property	x	

CONTRACT CLAUSES	Contracting Officer's Representative	Contracting Officer
Government-Furnished Property (Cont'd)		
b. Grant time extension for such delay		x
c. Make equitable adjustment for increase or decrease in quantities of Government-furnished property	x	
d. Order repair or replacement of defective Government-furnished property	x	
e. Maintain records of Government-furnished property	x	
f. Authorize disposal of surplus Government-furnished property or scrap		x
g. Fix time for presenting inventories of surplus Government-furnished property		x
GENERAL CONDITIONS		
Operations and Storage Areas		
a. Authorize or approve operations and storage areas	x	
b. Authorize erection of temporary buildings	x	
c. Determine if damage is caused by occupancy	x	
d. Authorize abandonment of temporary buildings or utilities	x	
e. Authorize use of established roadways or construction of temporary roadways	x	
Progress Charts and Requirements for Overtime Work		
a. Approve progress shedules	x	
b. Approve revised progress schedules	x	
c. Direct steps necessary to improve progress	x	
d. Terminate contractor's right to proceed for lack of due diligence		x
Subcontractors		
a. Receive lists of subcontractors	x	
b. Obtain statement that nondiscrimination clause and other labor clauses have been included in subcontracts	x	
c. Recommend cancellation of subcontract if subcontractor is incompetent or undesirable	x	
Quality of Articles, Materials and Equipment		
a. Request samples	x	
b. Inspect and test samples	x	
(See contract clause "Materials and Workmanship")		
Protection of Material and Work		
a. Direct measures for adequate protection of materials, supplies and work	x	
b. Determine that property should be protected by the Government and cost charged to contractor	x	

GENERAL CONDITIONS	Contracting Officer's Representative	Contracting Officer
Protection of Existing Structures, Utilities, Work and Vegetation		
a. Direct repair of existing structures, utilities or work damaged by contractor's operations	x	
b. Determine and direct extent of protection required for existing vegetation	x	
Possession Prior to Completion		
a. Determine whether Government shall take possession of or use any partially completed part of the work	x	
b. Recommend equitable adjustment in contract price or time if possession or use prior to completion delays progress of work or causes additional expense to contractor	x	
c. Make equitable adjustment		x
Suspension of Work		
a. Order suspension of work for convenience of Government		x
b. Extend time for ensuing delay		x
c. Make equitable adjustment in contract price in case of unreasonable delay		x
Labor Reports		
a. Require prompt submission of and check payrolls of contractors and subcontractors	x	
b. Direct furnishing of such other reports as may be required by the Department of Labor	x	
Cleaning Up, Inspect and direct cleaning of construction and storage areas	x	
Accident Prevention		
a. Enforce compliance with Corps of Engineers Manual	x	
b. Order additional safety measures	x	
c. Approve contractor's written proposals for effecting safety provisions	x	
d. Hold conferences with contractor to discuss safety program	x	
e. Prescribe procedures for safety of visitors	x	
f. Require the making of safety reports	x	
g. Notify contractor of noncompliance with safety provisions and action to be taken	x	
h. Issue orders stopping work pending compliance with safety provisions	x	
Inspection		
a. Insure strict compliance with terms of contract	x	
b. Inspect completed work	x	

SPECIAL CONDITIONS	Contracting Officer's Representative	Contracting Officer
SPECIAL CONDITIONS		
Commencement, Prosecution and Completion of Work		
Require commencement of work within period provided	x	
Liquidated Damages		
Determination and withholding of liquidated damages	x	
Contract Drawings, Maps and Specifications		
Determine that work conforms in strict accordance with contract drawings, maps and specifications	x	
Shop Drawings		
a. Monitor submission of Shop Drawings	x	
b. Approve shop drawings	x	
Rates of Wages		
Approve labor classifications not listed in contract (See Davis-Bacon Act clause of contract)		x
Variations in Estimated Quantities		
Determine equitable adjustment for overruns or underruns in estimated quantities if in contract	x	
Government-Furnished Property		
(See Government-Furnished Property Clause of Contract)		
Salvage Materials and Equipment		
Determine method of property control records for all materials or equipment specified to be salvaged	x	
Water		
a. Determine location of temporary water supply lines	x	
b. Direct removal of temporary water supply lines	x	
Electricity		
Approve temporary electrical connections and supervise payment arrangements, where applicable	x	
Airfield Safety Precautions		
Direct specified measures, where applicable	x	
Layout of Work and Surveys		
a. Determine changes if necessary for proper layout of work	x	
b. Suspend work when location and limit marks are not reasonably adequate to permit checking of work	x	
c. Supervise quantity surveys made for progress payments	x	
d. Make original and final surveys	x	

SPECIAL CONDITIONS	Contracting Officer's Representative	Contracting Officer
Payments for Preparatory Work (when applicable) Determine whether payment to be made for construction plant, materials, structures or facilities		x
Identification of Employees Direct and approve identification measures as may be necessary	x	
Insurance Required Direct and approve insurance as may be required	x	
Additional Supervision of Subcontracted Work (See also Contract Clause "Superintendence by Contractor") a. Determine that the number of superintendents, as may be required, are furnished	x	
b. Recommend waiver of requirements	x	
c. Waive requirements		x
Scheduling and Determination of Progress Determine that not more than the percentage provided is included in Rate of Progress for payments for materials delivered to site but not incorporated in the work	x	

Other requirements may be included in special contracts.

AIR FORCE INTERCONTINENTAL BALLISTIC MISSILE BASE CONSTRUCTION PROGRAM

HEARINGS
BEFORE THE
SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES
EIGHTY-SEVENTH CONGRESS
FIRST SESSION

MONDAY, 13 FEBRUARY 1961

Mr. SHEPPARD. The next witness we will have before the committee is Mr. Garland Everist, president, Western Contracting Corp.

STATEMENT OF GARLAND EVERIST, PRESIDENT, WESTERN CONTRACTING CORP.

Mr. EVERIST. My name is Garland Everist, of Sioux City, Iowa. I am president of the Western Contracting Corp. of that city, who, on April 12, 1960, submitted to the Corps of Engineers' Omaha district, the lowest responsible bid in the amount of $17,400,000 for the construction of operational bases, nine in number, in and about the area of the Lincoln Air Force Base, Lincoln, Nebr., known as contract No. DA-25-066-ENG-6186. The contract was awarded on April 15, 1960, with final completion of all work fixed at May 23, 1961. Subsequent to the award of the contract, on June 17, 1960, there was added to our contract the construction of three additional operational base sites, so that as of this date we are constructing 12 such sites.

65773—61——6

At this point I would like to point out the difference between the TITAN and ATLAS bases in that the TITAN bases have three general areas of construction with a period of 2 years to construct, and the ATLAS bases have 12 different areas of construction with essentially 13 months to construct—13 to 15 months, so there is in comparison a compression of time and results from any changes that occur are magnified.

Our company is a medium size contracting firm with experience in the performance of the various phases essential to missile base construction. Notwithstanding our relative size in the industry, we are sole venturers on this contract, and are performing approximately 75 percent of the work with our own forces.

As of February 1, 1961, our contract was 80 percent complete and is on the original progress schedule.

The ballistic missile program called for the research, design, development, manufacture, installation, and activation of the missile and its related facilities. Because of the experimental and developmental nature of the endeavor, changes and modifications are inherent. We understand, substantially all phases of the program were contracted on a cost reimbursable basis.

The construction of the launching complexes was taken out of the overall program and assigned for construction on a fixed-price basis. In determining this policy undoubtedly consideration was given to economy, efficiency, and freedom from friction within the program. To accomplish this, there were established arbitrary separations, boundaries, and limitations. In practice this policy is not functioning in the best interest of the program which is based on design-construction concurrency. All phases are interrelated, and the timely completion of the facility construction is essential to the program's success. The performance of the program has been delayed, is now being, and will continue to be delayed due to the inflexibility of administering a fixed-price type of contract.

I would like to outline the problems affecting this program with respect to our contract in three general categories: Magnitude of change; legal barrier; economic impact.

As you may know, our construction work consists of the building of what is known as hard sites for the ATLAS missile, scattered over an area equivalent to the State of Connecticut. We are required at each site to construct an underground launch control center, launching silo, tunnels, process and utility systems, roads and fencing, together with related facilities and appurtenances. The construction of these complexes started while the ATLAS missile was still in varying stages of research and design. The development of the ATLAS missile concurrently with the construction of the complexes, has resulted in a continuous stream of changes, modifications, and design growth.

Modifications to date have affected 312 pages of the original 476 pages of specifications, and 1,214 new drawings have been issued as compared to the original 355 drawings. Modifications have affected 68 percent of the structural steelwork and increased by 55 percent the number of field bolts. Modifications have increased the weight of the silo crib steel by 36 percent and the number of special connections per site have increased from 184 to 1,506.

Modifications have affected 77 percent of the mechanical piping work, with the utility piping system having been modified six times.

One critical piece of manufactured electrical control equipment has been modified eight times, the latest being only 3 weeks prior to contract installation date. The list is almost endless, even after these many changes; field revisions are continually necessary in order to produce a usable facility. Yet, in spite of the foregoing, we are being held to our original contract completion dates, and also with one exception Mod. 35 to intermediate dates of completion, referred to for convenience as "milestone" dates.

These modifications are being forced into the construction schedule, the impact of which throws the work out of orderly sequence, necessitates piecemeal operations and delays the progress of the work. There are physical limitations as to how much work can be performed, at any cost, within a given time under these conditions. We do not question the technological need for these changes, but stress the need within the ballistic missile program for realistic evaluation of the timeliness of such changes in terms of the entire program.

The magnitude of change within the program looms larger each day. This acts to deter the timely and economical completion of the construction work. Our efforts to proceed are rendered ineffectual by the lack of prompt and uninhibited direction from the Corps of Engineers for successful handling of the day-to-day problems involved in such complex and unusual work. This lack of unitary action within the program results in wasted effort, inefficiency, low productivity, and greatly increases the overall cost.

The legal barrier, created by the fixed price contract within the ballistic missile program, is evident in all Government-contractor relationships. Fixed price contracts are designed and are best suited to protect the Government's interests in cases where the design is fixed after careful study and consideration prior to the taking of bids. The few changes normally encountered are minor, and there is time for discussion, negotiation and resolution of problems. But that is not the situation confronting us today. We, as well as the Government, its designers and consultants, have entered upon a new and ever-evolving field.

In the performance of the silo excavation work, we encountered numerous and extensive changed subsurface conditions, as well as incompatibility of subsurface structure designs with respect to such conditions. The legal barriers of the fixed price contract did not permit a free and uninhibited exchange of views, discussions of new approaches and prompt decisions for unitary action, which could have resulted in a substantial saving in time and money. Our time and our money in that case.

To date, over 100 discrepancies or omissions in electrical specifications and drawings have been encountered. On those submitted to the Government for decision, the average delay has been 5 weeks. Once again, the inflexible requirements of the fixed price contract act to delay the orderly conduct of the work.

The Government prior to the solicitation of bids for our project, negotiated with a large number of companies for the furnishing of equipment and services to become appurtenant to that portion of the work to be undertaken by us. We have been told that this system of Government furnished property and assigned services contracts was an effort to speed up the completion of the ATLAS missile program. However, subsequent to the award of our project, these

contracts have been subjected to the numerous complicated revisions, modifications, and changes existent in this program. When we entered into that phase of our activities involving the handling of Government furnished property complete installation drawings were not available. Shipments were received with shortages and defective parts, and 42 percent of the equipment arrived later than contract specified dates. The assignment of the assigned services contracts disclosed discrepancies between the plans and specifications of the various contracts; the assignments disclosed incompatible contract completion dates; and the assignments disclosed conflicts of responsibility not previously known. Thus, we find that what we are being tendered is infinitely different from that which we had knowledge of at the time of bidding. Neither the Government nor the contractor can act freely under these conditions, and the legal barrier created by the fixed price contract leads to unilateral action on the part of Government.

Further legal barriers are established within the program by overlapping responsibilities of interested Government agencies and the several contractors involved. In the ATLAS program, we find Convair Astronautics with certain responsibilities and functions of inspection which act to delay our work. Work performed to the corps' satisfaction may not be acceptable to Convair. At the present time we are being delayed at five sites, with a maximum delay to date of 6 weeks, because of Convair's refusal to accept completed portions of the structural steel crib.

The most damaging aspect of the legal barrier is its effect on the prompt and equitable settlement of modifications and claims, involving consideration of time extensions and added costs of the work. This legal barrier delays conclusive action and restricts approach to realistics cost determinations.

The legal barrier, created by the fixed price contract, jeopardizes the success of the ballistic missile program and leads to the final arbitration of differences under Federal judicial systems.

The third category obstructing the success of the present ballistic missile program under the fixed price contract is economic impact.

As has been pointed out to you gentlemen, the growth and constant change of our undertaking is unprecedented, with performance being compressed within the time allotted for a vastly lesser dollar concept. Our industry has been called upon to perform complex and unusual work, and to proceed regardless of any difficulty encountered and at any cost. The financial burden of performing a fixed price contract which originally was $17,400,000 and which ultimately will grow to $48 million is enormous. This financial burden would not exist if a policy of timely payments for work performed was in effect.

Due to the multitude of changes we were unable to carry on the construction in a manner and sequence geared for economy, efficient operation, and timely completion. These changes forced our operations to a day-to-day basis in a manner not originally contemplated. The performance of the work in a piecemeal fashion and out of sequence occasioned delay and added greatly to the cost.

Under this fixed price contract major modifications were forced upon us with no extension of contract time. We were directed to immediately proceed with the work, with negotiations for the cost of performing such work to be handled at a later date. On some major

modifications, we have performed over 95 percent of the work and have not been able to agree upon the cost after 8 months of negotiations.

I will say we have had supplemental payments, on some modifications but not of the magnitude that would reflect the cost to us.

The fixed price contract does not allow timely settlement of claims and modifications by use of realistic or actual developed costs. The Government determination of the added cost of changes is basically a handbook estimate of what the cost might be under normal conditions without realistic consideration of the actual conditions. The differences as to what constitute "fair and reasonable costs" has not been reconciled under the fixed-price contract, and has resulted in unilateral action by the Government.

The refusal of the Government to recognize any and all delay to the work, has caused us to accelerate, by furnishing additional equipment, labor, supervision, engineering, and the like, in order to overcome delays. This acceleration has added greatly to our cost and financial burden. Moreover the Government has and is compounding this financial burden by the assessment of liquidated damages for slippages on interim completion dates.

The economic impact created by this fixed-price contract within the program places the contractor in an untenable position.

In my opinion, continuation of the present policies governing the ballistic missile program is fraught with hazard. The problems which have obstructed our efforts to date, will be more pressing as we enter the base activation phase of the program. This phase, involving the installation of the missile and its appurtenances, necessitates joint occupancy of the complexes by the construction contractor performing under a fixed-price contract and the base activation contractor performing under a cost-plus contract. The commingling of these contracts within the complexes will create further barriers to the successful completion of the ballistic missile program.

I am not here as a single contractor experiencing the difficulties and problems and frustrations I have briefly outlined. The ATLAS missile program, as far as our industry is concerned, is largely being undertaken by experienced and nationally known contractors. That fact alone should indicate that it is not a lack of professional skill or effort on the part of the contracting industry that has brought about the problems of which you are being advised at this hearing. In my judgment, these problems and situations are inherent in the program being undertaken and can only be solved by adopting contractual procedures to our portion of the program as are already in effect in other phases of the same program.

Action must be taken to unify all efforts toward the ultimate success of our national defense. Toward this end, it is proposed that all existing fixed price construction contracts in the ballistic missile program be converted to cost reimbursable contracts. By so doing, all concerned would be free in every respect to act in the best interest of the national defense.

In the several defense efforts over the years, work delegated to our segment of the industry was performed on a cost reimbursable basis with the Government's financial interests being protected not only by normal supervision and audit, but also, by renegotiation. The conditions which presently exist in the ballistic missile program have

created the same problems and conditions which existed in these prior national defense efforts. The past has shown that the interests of the Government not only from the viewpoint of economy, but also for speed and quality of production have been best served by a cost reimbursable type of contract with the many controls.

For your information, I am submitting with this statement several letters from our subcontractors and suppliers at Lincoln, which will further advise you of the difficulties being encountered in the performance of the present program.

We, our subcontractors, and suppliers, have been required to finance the Federal Government in this undertaking. Through our engagement in the construction of the ballistic missile facilities we have been severely hurt financially. At present we project a $12 million loss at Lincoln.

We request congressional action for the direction of immediate payment for the cost of the work and services performed by ourselves, subcontractors, and suppliers.

Thank you.

Mr. SHEPPARD. In your statement you mentioned intervention by Convair and I do not quite understand their function. What functions do they have insofar as their control of the contractor is concerned over the brick and mortar aspects?

Mr. EVERIST. That is hard to define because we have a contract with the Corps of Engineers, yet Convair people are swarming all over the sites, apparently checking out the work we are doing so when they take it from some other agency, they will have approved it at some previous point. They are there on the sites.

Mr. SHEPPARD. Do they actually issue directives as far as the construction on this project pertains?

Mr. EVERIST. Not to us, only they validate a portion of our structure before the Corps of Engineers can accept it. As I understand it, we have a certain tolerance we bid on. Convair interprets this tolerance one way, we and the corps and the engineering profession interpret it another. So we are at an impasse as far as proceeding any further where this steel erection is concerned.

Somebody has to decide who is going to evaluate this tolerance. We have got the answer, but I do not know what it is yet.

As I understand, we are going to proceed now with this.

This is just another instance of somebody else in this program that is making decisions which affect our ability to construct on time and for a reasonable price.

Mr. SHEPPARD. At the time you entered into your contract, was it indicated by indirection, or otherwise, that Convair was to act in an advisory capacity in the picture, or were you going to do business with the Army Engineers?

Mr. EVERIST. Our first conversation with our original contracting officer, and we have had three contracting officers, was that we had a contract with the Corps of Engineers. They were solely responsible for the execution of the work, and the type of the endeavor was such we had to complete on time. Delays could be paid for, but time extensions could not be given. He was half right; no extensions were given, but delays were not paid for either, so we ended up by financing delays, or the delays of the program.

So I would say in answer to your question, as far as our understanding was concerned, and as far as we still know, our contract is with the Corps of Engineers.

Mr. SHEPPARD. But it is being evaluated by Convair?

Mr. EVERIST. By Convair, and as I understand, the Air Force and others. I do not know how many, but there are others that affect the Corps of Engineers relationship with us.

Mr. WHITTEN. Whoever is there advising whoever is there, the representative of the Corps of Engineers is the one who tells you to make a change?

Mr. EVERIST. That is correct.

Mr. WHITTEN. And the only one?

Mr. EVERIST. We only work for the Corps of Engineers.

Mr. SHEPPARD. Insofar as Convair is concerned, they are not intervening into the picture to retard your function, timewise?

Mr. EVERIST. Yes, they are, in their relationship with the Corps of Engineers, not directly with us, to answer your question.

What happens is, naturally, we are all standing around the site and Convair says, "We will not validate this structure." The Corps of Engineers says, "We cannot take it then, either." So there we stand looking at each other. We do not have any relationship with Convair. This may have been overcome by this time. I am just pointing out it was a matter of delay, and that validation of portions of this work we are doing apparently has to be done by Convair before we can sell it to the Corps of Engineers.

If we ever finish this thing, we have to sell it to the Corps of Engineers. They in turn sell it to the Air Force, I understand. The Air Force turns it back to Convair to activate it and eventually gets it back. This, I say, is the way I understand it. I could be wrong.

So we are trying to sell something eventually the Air Force will buy, Convair will buy, and the corps can sell.

Mr. SHEPPARD. I do not quite follow you.

What is there about the picture that Convair says is no good?

Mr. EVERIST. Interpretation of tolerance on the erection of steel.

Mr. SHEPPARD. I see.

Mr. EVERIST. We have a 1 in 1,500 tolerance to erect this 165-foot structure. Our interpretation, and I believe that of the corps, is 1 in 1,500 gives you an inch and one-eighth from top to bottom. Convair has apparently interpreted that between any particular level a tolerance exists, so you then will pull down the tolerance to one-eighth of an inch between levels.

Mr. SHEPPARD. Who wrote the specifications? Did Convair?

Mr. EVERIST. No, sir. I do not know who wrote the specifications. I would like to find him sometime.

Mr. SHEPPARD. While we are on the topic, it might be well if there is spread on the hearings at this time what we are paying Convair for that type of supervision. May I have that figure inserted in the record, Mr. Secretary?

Mr. CHARYK. Very well.

(The information requested follows:)

At Schilling the cost of surveillance by CONVAIR is estimated at $1,250,000. This amount is considered to be a worthwhile expenditure by the Air Force.

Mr. SHEPPARD. What has been the traceable delay emanating from what I interpret to be a rather confused procedure?

Mr. EVERIST. The delay, basically, is cost to us. We have to overcome, or maintain a schedule. We get a delayed decision, for

instance. Something does not fit so we want to find out how to make it fit and it takes some time to get that answer. All we can do is to overcome the delay. The delay is not in the end product, the delay is to us and the cost is to us. I mean the contractor.

Mr. SHEPPARD. Assuming that you have started as of Friday, hypothetically, in your construction procedures, and you are interrupted on Monday—you cannot go on further with this type of construction, you cannot modify it; has that type of situation occurred?

Mr. EVERIST. Absolutely. That is one of the biggest things that has happened in these modifications. We have, what we claim, $23 million worth of modification to our site on which we have been paid $3 million in supplemental payments and minor adjustments.

Mr. SHEPPARD. How much of that change has been clearly indicated as the responsibility of the Convair interventions on the base as against those of the Engineers?

Mr. EVERIST. That, sir, I would be unable to answer. I do not believe Convair as such is causing, or has up to this point caused us much delay. I do not know what they will cause from here on out.

Mr. SHEPPARD. What is the present status of the project?

Mr. EVERIST. We are 80 percent complete.

Mr. SHEPPARD. Has your experience during the period of time in which 80 percent has been involved been what you have described here?

Mr. EVERIST. Absolutely, for the full period of time.

Mr. WHITTEN. Convair is to construct the missile itself?

Mr. EVERIST. Absolutely.

Mr. WHITTEN. And if Convair knows an inch and an eighth will prevent the eventual use of the missile, would it not be a pretty come-off if they did not intercede, whoever they have to go through? The site is for the missile, and if the missile requires a site of particular specification, though it should have been in the original specifications, but if it is not, it better be before they put the first missile in there for firing.

Mr. EVERIST. I think——

Mr. WHITTEN. I am only trying to keep the record straight. I do not know that such tolerance is too much but if it is, it better get corrected somewhere if that is the point.

Mr. SIKES. I think you did a good job in spelling out your problems. I would simply like to ask you at this point what are your recommendations in one, two, three order as to the things that could be done by Government to clarify this generally.

Mr. EVERIST. Well, my presentation was based on the fact I thought it could be resolved by changing the type of contract.

Mr. WHITTEN. To a cost-plus contract?

Mr. EVERIST. To a cost reimbursable contract. As far as I am concerned, this plus part you can leave out. I am trying to get rid of the minus part of it.

Mr. WHITTEN. Is that the only recommendation you have?

Do you think there are any other steps that would help solve this problem?

Mr. EVERIST. I do not believe I would be qualified to suggest anything further than what I know about our contract.

Mr. WHITTEN. Now, if all of this was on a cost-plus basis, it would not speed up anything, would it, it would just cost more?

Mr. EVERIST. Yes.

Mr. WHITTEN. How would it?

Mr. EVERIST. It would speed it up by the fact we would not back off and look at something.

For instance, we have lost time. We are losing time, we will say validating the crib structure. If we were working, I would say, on a cost reimbursable type contract everybody would, instead of scurrying off trying to defend their position, be figuring out how to get it built.

Mr. WHITTEN. If the Government's finances were in a little better shape, and if we had not been able to show how very, very expensive a cost-plus contract is, I could follow you. You have heard the other testimony here. Your contract covers payment on an equitable basis for the expense of any modifications, does it not?

Mr. EVERIST. Yes, sir.

Mr. WHITTEN. And if you had relied on the contract and the good faith of the Government and gone ahead instead of dillydallying among yourselves trying to get a cost-plus contract, this delay would not have occurred, would it?

Mr. EVERIST. I would like to point out one thing.

Mr. WHITTEN. I am asking you a question because you just said if you had a cost-plus contract you would not back off and look and argue about it before you carried your contract out, but you are inferentially saying you are doing it now.

Mr. EVERIST. I am not saying we are doing it. In the end result, after that has been done, we make the time up and are on schedule.

Mr. WHITTEN. You have heard other witnesses say in the last few weeks when they make modifications now they do it, if I remember the terminology, in a two-part amendment of contracts. Since the Government has started advancing money when they tell you to change, does that not take care of most of the complaints you have?

Mr. EVERIST. No, sir; because the amount of money they advance is not anywhere near the magnitude required to complete the change.

Mr. WHITTEN. You say you will lose $12 million. How many claims do you have pending and what is the total? I mean how much do you have in the way of claims against the Government in connection with this contract?

Mr. EVERIST. We have three and a half million dollars worth of direct costs on claims submitted and denied by the contracting officer.

Mr. WHITTEN. That is subject to suit?

Mr. EVERIST. Yes, sir; we can now take our administrative remedies to the courts.

Mr. WHITTEN. How many other claims do you have where you have not put in claims in the regular form?

Mr. EVERIST. We have minor claims. As far as we are concerned that is what we are talking about.

Mr. WHITTEN. Three and a half million dollars?

Mr. EVERIST. In that neighborhood. That is exclusive of impact for those claims. We have asked for seven and a half million dollars, adding $4 million worth of impact to those claims.

Mr. WHITTEN. So if you collect impending claims you will be all right on this contract?

Mr. EVERIST. No, sir.

Mr. WHITTEN. Your statement of losses is just marking off all claims you have?

Mr. EVERIST. That is what the Government has done to date.

Mr. WHITTEN. Some are not even in shape for claims?

Mr. EVERIST. I am talking about our claims.

Mr. WHITTEN. Some of your claims are not in form.

Mr. EVERIST. They have all been presented. They are in, and they have been denied. You could say that in general.

Mr. WHITTEN. Seven and a half million dollars?

Mr. EVERIST. That is the amount included in those shafting claims, of which three and a half million dollars was expended while we were doing the work and the other was the impact on the remainder of the work.

Mr. WHITTEN. I believe you said this was let on a competitive bid basis?

Mr. EVERIST. That is correct.

Mr. WHITTEN. If the Government had found this after letting it out on a competitive bid basis, would they have had the right to renegotiate?

Mr. EVERIST. Yes.

Mr. WHITTEN. This was on a competitive bid?

Mr. EVERIST. Yes, sir.

Mr. WHITTEN. You say the Government should suddenly change the contract after it was entered into and make it a cost-plus?

Mr. EVERIST. I do, sir.

Mr. WHITTEN. If that would be justified would you be justified in just passing through the Congress a claim in the amount of this just because you lost money on it and the Government refused to pay it?

Mr. EVERIST. I really don't care what you call it, apples or bananas. I just would like to see the money some way or another.

Mr. WHITTEN. I am getting that impression, too.

Mr. EVERIST. All I would like to see would be a timely payment. That is all we ask.

Mr. WHITTEN. What is the nature of these claims they turned down?

Mr. EVERIST. Shafting claims, subsurface conditions and inadequate bracing on the shafts.

Mr. WHITTEN. You didn't do that work yourself?

Mr. EVERIST. Yes, sir; we did it.

Mr. WHITTEN. Your claim is because it took more to do it because of some misrepresentation or failure to show what you were up against?

Mr. EVERIST. We feel there were changes, and our consultants, who also are consultants for the Air Force and Corps of Engineers feel we definitely have substantiated conditions of claim.

On all eight holes we struck out because the Corps of Engineers did not feel we were justified.

Mr. WHITTEN. Is this too voluminous for me to ask, since this is something adjudicated, to ask in this case, and I am sure the committee cannot go with all of them, I would like to see the claims, the findings, and the records made so we can have it for determination.

Mr. EVERIST. We would be glad to give it to you.

Mr. SHEPPARD. If you would please supply that to the committee.

Mr. EVERIST. Yes, sir.

(The information requested was supplied the committee.)

Mr. WHITTEN. That is all.

Mr. JONAS. You have indicated you would like to find out the name of the man who wrote those specifications. I have a man I would like to have you locate if you can, the man who told you to go ahead immediately and proceed with major modifications and that the cost thereof would be paid at a later date.

Mr. EVERIST. Our contracting officer through his representative on our site is this man.

Mr. JONAS. Is he the man who has been arguing with you for 8 months and refusing to come to a settlement with you?

Mr. EVERIST. I wouldn't say he is refusing. I would say we are at different poles. He would like to settle on his basis and we would like to settle on ours. We cannot get together.

Mr. JONAS. How far apart are you?

Mr. EVERIST. I would say we are probably $15 million apart.

Mr. JONAS. You told Mr. Whitten that your total claims submitted amounted to $7 million. How can you be $15 million apart?

Mr. EVERIST. This is both modifications and claims we are talking about.

Mr. JONAS. You said the total modifications were worth $23 million.

Mr. EVERIST. They paid $3 million. I don't know what the ultimate settlement will be.

Mr. JONAS. The remainder is in controversy?

Mr. EVERIST. Yes, sir.

Mr. JONAS. Are you very sincere and do you feel you are honest in your belief that you are entitled to this $23 million?

Mr. EVERIST. I would say this, sir: We probably would settle for less.

Mr. JONAS. I am not in favor of the Federal Government doing that to anybody; if you are fairly entitled to $23 million I think you ought to have it. It is all right to talk about having faith in your Government, but the Government is actually a group of individuals. I have seen some individuals working for the Government that I wouldn't have much faith in. I suspect you are getting at about that point yourself, are you not?

Mr. EVERIST. Yes, sir.

Mr. JONAS. I don't see how it is possible to have that wide a divergence between you and this contracting officer as to the cost and value of this modification work which he told you to do.

Mr. EVERIST. It stems from the nature of the work, sir. I wouldn't believe so, either. As a matter of fact, if I told this to anybody else, which I have done, they ask you how did that ever happen. How could you ever get into such a position? I will say it is difficult to understand until you see how these things are interrelated as far as the changes are concerned and what the costs are to overcome delays.

Mr. JONAS. What I would do if I got in the middle of one of these things is to have them put it in writing. If somebody tells me to make a modification and he will see to it I would be paid, I would want more assurance than just his word.

Mr. EVERIST. He is a representative of the contracting officer and he is really executing the contract or administering the contract which we have.

Mr. JONAS. No; he made modifications in some instances amounting to 70 percent. There are 312 pages of modifications out of an original 476 pages.

Mr. EVERIST. Yes, sir.

Mr. JONAS. That is more than 50 percent. Yet you are being held to your original target completion dates and you have been penalized for slippages because you cannot do all of this extra work in the time you originally contemplated.

Mr. EVERIST. That is exactly the point I am trying to make.

Mr. JONAS. Who is the man who assessed these damages for slippage? That is another man whose name I would like to have.

Mr. EVERIST. The Corps of Engineers by contract state, rightly so, that they have to. That is the contract and that has not been changed, and therefore that is the date. If the work is not done they assess the damages.

Mr. JONAS. Notwithstanding the fact they required you to make all these modifications?

Mr. EVERIST. That is correct.

Mr. SHEPPARD. That is not a change in the contract?

Mr. EVERIST. It hasn't been negotiated for any time, at least, and therefore the contract as we originally had it still is in effect.

Mr. SHEPPARD. In other words, you had an original contract.

Mr. EVERIST. Yes, sir.

Mr. SHEPPARD. That original contract contained certain language. Along comes a revision, perhaps a necessary one, but that within itself changes the contract right there unless the contract carried those possibilities. If so that is another story.

Mr. EVERIST. It did, and it gave them the right to say if they wanted those changes made with no extension of time they would pay for those changes with no extension of time.

Mr. SHEPPARD. There is only one thing about you that puts me in a peculiar status—you are a pretty sharp witness. I just can't quite understand you with your background and apparent ability shooting yourself for X million dollars on somebody else's verbiage.

Mr. EVERIST. We have this contract and we cannot walk away from it. We will finish it or it will finish us, but we will get it done. the problem is that these changes have been occasioned and because of the inflexibility of the contract we are working under we cannot get them paid, or we cannot get the time.

Mr. SHEPPARD. The point is this: Whoever the gentleman was involved here was a representative of the Federal Government.

Mr. EVERIST. Yes, sir.

Mr. SHEPPARD. He was the fully recognized agent of the Federal Government. He reaches into your bankroll for X millions of dollars. You take his word for it.

Suppose that fellow died tomorrow morning? You have more confidence in human nature than I have.

Mr. EVERIST. I didn't realize I had that much when we started out.

Mr. WHITTEN. The contract provides that modifications are to be paid for in addition to the regular contract?

Mr. EVERIST. Yes, sir.

Mr. WHITTEN. You do not mean to tell us that these modifications have been oral but in each case they have been written, have they not?

Mr. EVERIST. That is right.

Mr. WHITTEN. There is no oral statement. Since they were written under terms of the contract you are entitled to be paid for them.

Mr. EVERIST. That is right.

Mr. WHITTEN. Your contracting firm organized a firm for this particular purpose, or enlarged it because nobody had been doing this kind of work prior thereto. Is that right? Was this a new venture for you in this type of work?

Mr. EVERIST. Yes.

Mr. WHITTEN. In the modification area where the contract called for increased payments, you have been paid what percentage in the modification area? That is where I got lost a while ago. I was talking about claims so I didn't ask about payments on modifications.

On modifications where they are supposed to pay you, what has been the amount of your demand for extra cost and what is the amount the Government paid you? Also, what is the amount in controversy?

Mr. EVERIST. I don't know the exact figures but we have asked for approximately $23 million for the modifications which have been made to our contract. Supplemental payments on those contracts have amounted to about $3 million.

Mr. WHITTEN. Has the remainder been turned down or is that now pending between you and representatives of the Government?

Mr. EVERIST. Pending between our firm and the representatives of the Government and we are proceeding with the work.

Mr. WHITTEN. If that is paid you come out all right; if it is not you are in bad shape. Is that about it?

Mr. EVERIST. I would say so.

Mr. WHITTEN. And they gave you a two-part contract. That is relieving the immediate situation so far as present modifications are concerned to some degree?

Mr. EVERIST. To the degree from $3 million to $23 million, it is.

Mr. WHITTEN. I am talking about modifications from here on. That relieves what caused this other to occur. Is that right?

Mr. EVERIST. In future work?

Mr. WHITTEN. Yes.

Mr. EVERIST. Possibly.

Mr. JONAS. Your modifications exceed the original contract by about $6 million.

Mr. EVERIST. That is correct. Right now our contract is authorized to be in the neighborhood of $31 million.

Mr. JONAS. $17 million was the contract figure, and your bill is for $23 million?

Mr. EVERIST. I would like to state this: we bid on nine sites. Some of the others bid on 12. They added three sites and in so doing our contract was raised to approximately $24 million.

Mr. JONAS. It is just about double, then?

Mr. EVERIST. About double; yes, sir.

Mr. JONAS. Can you give the committee some examples of the types of modification orders you receive? That is doubling a contract and it is almost inconceivable to me. You might as well start over again.

Mr. EVERIST. The problem is not in the actual physical work to be done if it had not been done or didn't fit into a lot of other work. If you add a piece of steel worth 5 cents a pound or something, by the time we take it out, make it fit, and fool around, it is worth $2,000.

It doesn't bear any relation to the cost before doing it. A great portion of that $23 million is based on the impact to the remainder of the work.

Mr. JONAS. Modifications had to be substantial to be doubled, but did they involve a great deal?

Mr. EVERIST. It practically changed the entire crib structure, the steel structure in the silo. They changed the process piping. They standardized everything by modifications.

They wanted to standardize the connections of everything in the crib. By that time we had spent considerable amount of time, money, and effort prefabricating things that no longer would fit.

Then we not only threw away what we made but we had to start all over again and fit it into another situation.

Mr. JONAS. I would be interested in hearing somebody explain why that couldn't have been anticipated.

Mr. SHEPPARD. We will get to that with the military.

Mr. JONAS. It probably all goes back to something Mr. Paul said this morning—the contract is all right. You knew what you were signing. It all depends upon the good faith of the people who execute them. Is that not so?

Mr. EVERIST. That is correct.

Mr. JONAS. If they act in good faith——

Mr. EVERIST. And the authority of the people who execute them.

Mr. JONAS. Of course, there might be a difference of opinion as to what is good faith. Somebody might claim the contractors are not showing good faith.

Mr. EVERIST. When we have the kind of money we have in that, sir, I think we have exhibited good faith.

Mr. JONAS. You have gone ahead and continued to finance. As to this penalty assessed against you, was that just billed to you?

Mr. EVERIST. They deduct it from our payments.

Mr. JONAS. How much did that amount to?

Mr. EVERIST. At the present time about $140,000.

Mr. JONAS. That had to be done?

Mr. EVERIST. According to the contract document.

Mr. JONAS. The document provides interim dates you must meet?

Mr. EVERIST. That is right.

Mr. JONAS. If you fail to meet one of those dates you are subject to a penalty?

Mr. EVERIST. That is correct.

Mr. JONAS. Yet they provided 100-percent modifications which necessarily affected the speed with which you completed the contract. Could you not plead that against the assessment of the penalty?

Mr. EVERIST. We have.

Mr. JONAS. You hope to finally when you get into court?

Mr. EVERIST. Yes.

Mr. JONAS. Did you make that argument?

Mr. EVERIST. We discussed that at great length with the contracting officer. He has certain limitations of action and that is one of them.

Mr. JONAS. Is he the one who told you to go ahead with these major modifications?

Mr. EVERIST. I will correct that—this is all by written modification and under the regular terms of our contract we perform that way.

Mr. JONAS. Off the record.

(Discussion held off the record.)

Mr. SHEPPARD. What does it cost you in interest to continue with your payments and to continue with your contract requirements under the contract? I refer to just the interest rate.

Mr. EVERIST. The interest in furnishing the dollars depends on when we get paid. Assuming we get paid just even and get our money out at the end of this, interest on the money will probably be a half million dollars. If we have to take it through the courts the interest will probably amount to $5 million.

Mr. SHEPPARD. Further questions?

Mr. WHITTEN. Back to the statement about a cost-plus contract, you agree it would be the obligation of the Government to refuse these costs. If they refuse them now on the ground they are not excusable and are not required they would be under the same obligation under the cost-plus contract, would they not?

Mr. EVERIST. I do not know the ramifications of "responsible."

Mr. WHITTEN. You have not had cost-plus contracts?

Mr. EVERIST. Not for quite some time, sir.

Mr. WHITTEN. Have there been elements of costs turned down on the ground they were not required? You have had no occasion to talk about it?

Mr. EVERIST. No.

Mr. JONAS. Did you ever build anything else for the Government?

Mr. EVERIST. Yes, sir, many things. As a matter of fact, I would say 80 percent of our work is for governmental agencies.

Mr. JONAS. Which agencies?

Mr. EVERIST. Corps of Engineers, Navy, Bureau of Reclamation. I might add, if I could, we have had in our relative position contracts, and a great number of them, on Strategic Air Command bases. The relationship between the Air Force, the Corps of Engineers, and ourselves, the contract again was with the Corps of Engineers with the Air Force paying for it, we encountered no problem. That is why when we entered into this situation we thought historically the things would proceed on the same basis.

However, things have not.

Mr. JONAS. Your experience is different in that you made money on the other contracts and you will lose money on this.

Mr. EVERIST. I wouldn't say that.

Mr. JONAS. You didn't make money on all of them?

Mr. EVERIST. I would be very happy to say we made money on half of them, or any of them.

Mr. JONAS. You have a substantial potential loss here. You couldn't do that every day, could you?

Mr. EVERIST. I don't know if we can do it 1 day.

Mr. JONAS. What I am getting at is this: You must have had similar experiences with respect to change orders, maybe not to the extent of these modifications you had here, but you had experienced the same kinds of problems to a lesser degree on some of the other contracts?

Mr. EVERIST. Yes, sir.

Mr. JONAS. Did you have this kind of difficulty in making a settlement or coming to a meeting of the minds such as you are having now?

Mr. EVERIST. No. It is a different relationship and that is why we recommend a different handling of the contract. Something has changed.

Mr. JONAS. What is the different relationship?

Mr. EVERIST. As I analyze it it is that the Corps of Engineers has not the final say as to what we are doing. If they had designed it, if they had——

Mr. JONAS. Wait a minute. The Corps of Engineers representative, the contracting officer, the area engineer, makes these determinations, does he not?

Mr. EVERIST. Yes. What I think the difference is, is that he is bound by other relationships than we have normally known. I don't know what they are or why.

Mr. JONAS. With whom have you had your negotiations about the $23 million?

Mr. EVERIST. Our people at the area level. We have a negotiating team and they have. That is another waste of manpower. They work these things out, trying to arrive at something.

Mr. JONAS. But you have not been able to get an agreement even tentatively at the working level, so you cannot blame somebody in the Air Force or some other agency of the Government if you cannot get a tentative agreement with the first man you negotiate with.

Mr. EVERIST. I think he is restricted by direction.

Mr. JONAS. What kind of directions does he have?

Mr. EVERIST. I don't know. If our historical experience with the Corps continued, we would not be experiencing this great loss.

Mr. JONAS. You would say this situation in which you find yourself now is unique in your long experience of contracting with other Government agencies?

Mr. EVERIST. Absolutely.

Mr. JONAS. That is all, Mr. Chairman.

Mr. WHITTEN. I am trying to understand why there is more problem here. Where does this particular work come? Is this one of the earlier types of work done and where they had less to go by?

Mr. EVERIST. I think we were the second one of the ATLAS–F bases let. Many more of the changes affected our job than probably affected the others.

Mr. WHITTEN. This $20 million we come back to as to modification cost, is that just a case of not being able to settle it at the local level and each side has to submit his own view? Is that an apt description of ths situation or has somebody already taken a position at other than the lowest level?

Mr. EVERIST. I don't think any position has been taken other than that the cost resulting from the impact of the change cannot be evaluated and paid under the present framework of our contract.

Mr. WHITTEN. That is at the local level?

Mr. EVERIST. At the contracting officer level.

Mr. WHITTEN. Anything beyond that he could not sign if he wanted to?

Mr. EVERIST. That is right.

Mr. WHITTEN. So, is not the normal sequence the following: He could not possibly sign this. You have some agencies that can sign $150,000 claims, and so on; under the scheme of things this has to come up.

How long ago did you and the local man give your different sides of the story? How long since it was completed at the local level and ready to go to higher level?

Mr. EVERIST. I would say this: We are not dealing with one thing but a great number of changes, 92 total modifications. They add up to this total figure. Some started at the beginning, some we are still getting. There is no date we would have concluded negotiations on something and say we are at an impasse. We are all the time getting further substantiation of our costs.

One of the biggest obstacles is the fact that the actual cost, the money we expend, is not taken into consideration or cannot be used as a criteria of what the change should be worth.

Mr. WHITTEN. As I understand it, in other words, there seems to be little argument about the first step in increased cost, such as changing this to that. It is the resulting cost down the line which is somewhat in the area of conjecture. It is open to proof.

Mr. EVERIST. That is right.

Mr. WHITTEN. Whether it affected one step, two steps, three steps, all the way down the line, it is in that area where the arguments largely exist?

Mr. EVERIST. That is right.

Mr. WHITTEN. So this is a number of claims which totals $20 million. Over what period have they stretched? How long has the earliest substantial claim been pending without some decision?

Mr. EVERIST. We mentioned 8 months. I suppose that was the maximum period.

I am not trying to be critical of the people with whom we are negotiating. What it amounts to is the restrictions they have, in working out these things. We have presented a number of methods showing the cost of this impact on later work. They have not yet satisfied the criteria of payment under this form of contract.

Mr. WHITTEN. So there are two things. One, the committee might urge that the Government speed up determination. You would have us modify that criteria. You feel the criteria required before you can collect for later costs is a little tougher than you think should be in order. It is a little too restrictive?

Mr. EVERIST. To this date it has not been too restrictive that they have not allowed any of it.

Mr. WHITTEN. You said it was because they had not reached the point of setting up criteria.

Mr. EVERIST. That is right.

Mr. WHITTEN. You will need some criteria set up and you think a criteria should be broad enough for all these things to be included?

Mr. EVERIST. That is my opinion.

Mr. WHITTEN. That leaves this: In view of your experience, where modifications carry with them the two-part provisions, that should help prevent this type of thing from occurring in the future?

Mr. EVERIST. It has not operated adequately or satisfactorily on our job, and we are using it. I would say the Corps to the best of their ability is attempting to make payments under that provision.

Mr. SHEPPARD. Thank you very much.

65773—61——7

LIST OF FIRMS WHICH WERE FURNISHED PLANS
AND SPECIFICATIONS FOR BIDDING ON
Construction of WS-107A-1 Operational Bases, 551-1 through 551-9(-12)
in the vicinity of Lincoln Air Force Base, Lincoln, Nebraska
RNO-25-066-60-52

A. B. T.
% J. O. Maxey
155 - 6th Ave.
New York, N. Y.

E. J. Albrecht Co.
2626 W. 26th St.
Chicago 8, Ill.

Allis-Chalmers Mfg. Co.
Attn: H. B. McCreal
P. O. Box 512
Milwaukee 1, Wisconsin

American Bridge Div., USS Corp.
1349 First Natl. Bank Bldg.
Denver 2, Colo.

American Instrument Co.
8030 Georgia Ave.
Silver Spring, Md.

Anaconda Metal Hose Div.
698 S. Main
Waterbury 20, Conn.

Armstrong Contr. & Supply Corp.
2526 Summit St.
Kansas City 8, Mo.

Asstd Piping & Engr. Co., Inc.
1707 W. Compton Blvd.
Compton, Calif.

Automatic Sprinkler Corp. of America
24 West 15th Ave.
No. Kansas City 16, Mo.

Barton Instrument Corp.
580 Monterey Pass Road
Monterey Park, Calif.

Beacon Constr. Co.
102 Hano St.
Boston 34, Mass.

Brown & Kerr
1711 Church St.
Evanston, Ill.

Builders' Specialty Serv., Inc.
P. O. Box 2098
Santa Fe, New Mexico

Busch & Latta Painting Co.
4366 Finney Ave.
St. Louis 13, Mo.

Capitol Bridge Co.
1001 N. 9th St.
P. O. Box 27
Lincoln, Nebr.

Capitol Steel & Iron Co.
Box 2437 Stockyards Sta.
1726 So. Agnew
Oklahoma City 8, Okla.

Ceco Steel Products Corp.
1141 No. 11th St.
Omaha 2, Nebr.

City Electric Co., Inc.
417 Sumner Ave. NW
Albuquerque, N.M.

Cleveland Electric Co.
P. O. Box 1636
Denver 1, Colo.

Cleveland Electric Co.
P. O. Box 5097
Jacksonville 7, Fla.

Cloverland Contracting Co.
Erie Ave.
Crystal Falls, Mich.

Cleveland Elec. Co. of S.C.
P. O. Box 1965
Columbia, So. Carolina

A. H. Bennett Co.
P. O. Box 142
1921 E. 4th St.
Sioux City 2, Iowa

Bethlehem Steel Co.
Prudential Bldg. Rm 2700
Chicago, Ill.

Bigelow-Liptak Corp.
13300 Puritan
Detroit 27, Mich.

Black Sivalls & Bryson Inc.
Attn: R. H. Gronau
7500 E. 12th
Kansas City, Mo.

Blount Bros. Constr. Co.
P. O. Box 949
Montgomery, Ala.

Contracting & Mail Co.
1235 Dodge Ave.
Evanston, Ill.

Continental-Emsco Co.
P. O. Box 359
Dallas 21, Texas

Cyclone Fence
13600 So. Brandon
Chicago, Ill.

Cyclone Fence Dept. USS
American Steel & Wire Div.
P. O. Box 542
Omaha 1, Nebraska

Decatur Iron & Steel Co.
P. O. Box 72
Decatur, Ala.

Dearborn Machry Movers, Inc.
Attn: Robert Doyle
3300 Maple
Dearborn, Mich.

Des Moines Steel Co.
P.O. Box 956, 421 So. West 5th St.
Des Moines 4, Iowa

Dodson Engineering Co.
4451 Douglas St.
Omaha 31, Nebr.

Colorado Fuel & Iron Corp.
Realock Fence Dept. P. O. Box 192
Denver, Colorado
Attn: E. J. Willoughby

Commercial Shear. & Stmpg. Co.
P. O. Box 2036
Salt Lake City, Utah

Commercial Shearing & Stampg. Co.
1775 Logan Ave.
Youngstown 1, Ohio

Condon-Cunningham Co.
4229 Lafayette Ave.
Omaha 3, Nebr.

Consolidated Western Steel
P. O. Box 2015, Terminal Annex
Los Angeles 54, Calif.

Fischbach & Moore, Inc.
2100 Clay St.
Denver 11, Colo.

Flexonics Corp. Expansion Joint Div.
2416 Jackson St.
Savanna, Ill.
Attn: Robt. Quick

Foley Bros. Inc.
900 New York Bldg.
St. Paul 5, Minn.

The Howard P. Foley Co.
P. O. Box 1500
Salt Lake City 10, Utah

Foster-Marsch Corp.
3911 Pacific Highway
San Diego 1, Calif.

Foster-Wheeler Corp.
Attn: W. J. Dye
666 Fifth Ave.
New York 19, N. Y.

Fruin-Colnon Contr. Co.
1706 Olive St.
St. Louis 3, Mo.

George A. Fuller Co.
3100 W. 8th St.
Los Angeles 5, Calif.

Dollinger Corp.
Rochester 3, N. Y.

Dravo Corp. Constr. Div.
Neville Island
Pittsburgh 25, Pa.

Eaton Metal Products Co.
4800 York St.
Denver 16, Colo.

Martin K. Eby Const. Co., Inc.
P. O. Box 1679
Wichita 1, Kansas

Embee - Hamman Inc.
928 No. Main
Wichita 5, Kansas

Ets-Hokin & Galvan
P. O. Box 13036
San Diego 1, Calif.

Farwell Co., Inc.
P. O. Box 7668
Dallas, Texas

Fenix & Scisson, Inc.
P. O. Box 336
Marcus Hook, Pa.

Fire Lock Corp.
1147 E. Market St.
Long Beach 5, Calif.

G. W. Falloway Co.
220 S. First Ave.
Arcadia, Calif.

Genl. American Transportation Corp.
135 So. LaSalle St. Rm 3105
Chicago 90, Ill.

General Concrete Co.
P. O. Box 1012
Lincoln 1, Nebr.

General Electric Co.
Attn: M. Meyer
P. O. Box 19038
Houston 24, Texas

General Steel Co.
P. O. Box 487
Ft. Worth 10, Texas

General Steel Prod. Co.
P. O. Box 828
Lincoln, Nebraska

Goble & Sampson
1737 Franklin St.
Denver 18, Colo.

Gould-Nat'l Batteries, Inc.
Attn: S. L. Douglas
467 Calhoun St.
Trenton, New Jersey

Graver Tank & Mfg. Co.
4809 Tod Ave.
East Chicago, Ind.

Graybar Electric Co., Inc.
3626 Martha St.
Omaha 5, Nebr.

Grinnell Co., Inc.
Attn: L. L. Dunaway
P. O. Box 7371, 2316 Burlington Ave.
No. Kansas City 16, Mo.

S. J. Groves & Sons Co.
500 Wesley Temple Bldg.
Minneapolis 3, Minn.

Paul Hardeman, Inc.
10579 Dale Ave.
Stanton, Calif.

Herring-Hall-Marvin Safe Co.
N. Carter Hammond
Hamilton, Ohio

W. F. Hoppe Lbr. Co.
421 N. 9th St.
Lincoln 8, Nebr.

G. E. Humphrey Elec. Constr.
Box 1161
Rapid City, So. Dakota

I-T-E Circuit Breaker Co.
5002 Dodge St. Rm 205
Omaha 32, Nebr.

International Steel Co.
1321 Edgar St.
Evansville 7, Ind.

T. L. James & Co.
P. O. Drawer 8
Kenner, La.

Jerrold Electronics Corp.
15th & Lehigh Ave.
Philadelphia 32, Penna.

Johnson Machine Works, Inc.
318 No. 11th St.
Chariton, Iowa

Johnson, Drake & Piper, Inc.
1138 Baker Bldg.
Minneapolis 2, Minn.

Johnson Service Co.
3209 Leavenworth St.
Omaha, Nebr.

Al Johnson Constr. Co.
608 Foshay Tower
Minneapolis 2, Minn.

J. A. Jones Const. Co.
209 W. 4th
Charlotte, No. Carolina

Johnston Pump Co.
3272 East Foothill Blvd.
Pasadena, Calif.

Kaiser Engineers
1924 Broadway
Oakland 12, Calif.

Peter Kiewit Sons Co.
1024 Omaha Natl Bank Bldg.
Omaha 2, Nebr.

Kingery Construction Co.
1941 "Y" St. Box 1723
Lincoln, Nebr.

Klemp Metal Grating Corp.
6601 S. Melvina Ave.
Chicago 38, Ill.

Korshoj Construction Co.
1545 Washington St.
Blair, Nebr.

Larkin Company
P. O. Box 146
Moosup, Conn.

Larsen & Co.
365 W. 4th St.
Salt Lake City 1, Utah

Lincoln Equipment Co.
315 West "O" St.
Lincoln 1, Nebr.

Line Material Industries
McGraw-Edison Co.
P. O. Box 2077
Milwaukee 1, Wisc.

Lukens Steel Co.
Attn: Mr. J. A. Ross, Jr.
Coatesville, Pa.

The Lukenheimer Co.
360 Annex Station
Cincinnati 14, Ohio

D. E. McCulley Co.
1903 Jones St.
P. O. Box 1134
Omaha 1, Nebr.

MacDonald Constr. Co.
1310 S. Grand Ave.
St. Louis 4, Mo.

Malan Construction Corp.
2 Park Ave.
New York 16, N. Y.

Macco Corp.
14409 So. Paramount Blvd.
Paramount, Calif.

Massman Construction Co.
3917 Broadway
Kansas City, Mo.

Midco Supply Co.
1346 S. 20th
Omaha, Nebr.

Midwest Carpet Co.
2509 Leavenworth
Omaha, Nebr.

Midwest Equipment Co.
1614 Izard St.
Omaha 2, Nebr.

Midwest Metal Culvert Inc.
P. O. Box 1349
Sioux City, Iowa

Mine Safety Appliances Co.
201 N. Braddock Ave.
Pittsburgh 8, Pa.

Minneapolis-Honeywell Co.
403 Saddle Creek
Omaha, Nebraska

Miss. Valley Flood Contr. Branch
Associated General Contractors
203 Hotel Peabody
Memphis 3, Tenn.

Moretrench Corp. Attn: Engrg Dept.
P. O. Box 316
Rockaway, N. J.

Morrison-Knudsen Co., Inc.
319 Broadway
Boise, Idaho

Morrison-Knudsen Co., Inc.
411 West 5th St.
Los Angeles 13, Calif.

Mosher Steel Co.
P. O. Box 5651
Dallas 22, Texas

Mult-A-Frame Corp.
6401 Epworth Blvd.
Detroit 10, Mich.

Nail Annealing Box Co.
Washington, Penna.

Napoleon Steel Contrs.
Room 14, Charles Bldg.
Napoleon, Ohio

Natkin & Co.
1400 Furnas
P. O. Box 1427
Lincoln 1, Nebr.

National Tube
525 William Penn Place
Pittsburgh 30, Pa.

Olson Construction Co.
840 So. Jason
Denver 19, Colo.

Olson Const. Co., Inc.
410 So. 7th St.
Lincoln 8, Nebr.

Omaha Steel Works
609 So. 48th St.
Omaha 6, Nebr.

P. W. Industries, Inc.
11200 Roosevelt Blvd.
Philadelphia 15, Pa.

Pacific Coast Steel Erect. Co.
P. O. Box 1362
Tacoma, Wash.

James G. Pierce & Assoc. Ltd.
4608 North High St.
Columbus 14, Ohio

Penn-Southern Const. Co.
152 Wabash Ave.
Pittsburgh 20, Pa.

The Permutit Co.
50 West 44th St.
New York 36, N. Y.

H. G. Peterson Co.
2966 Harney St.
Omaha 31, Nebr.

Philadelphia Gear Corp.
Schuylkill Expressway
Philadelphia, Pa.

Pioneer Pipe & Supply Co.
20th & Izard
Omaha 2, Nebr.

Pittsburgh Des Moines Steel Co.
1015 Tuttle St.
Des Moines 8, Iowa

Powers Regulator Co.
3171 Leavenworth St.
Omaha 5, Nebr.

Process Engineering, Inc.
Foot of Chase St.
Methuen, Mass

The Protectowire Co.
P. O. Box O
Hanover, Mass

Reliance Steel Products Co.
McKeesport, Penna.

Reynolds Elec. & Engr. Co., Inc.
Box 1040
Englewood, Colo.

Richmond Screw Anchor Co.
315 So. 4th St.
St. Joseph, Mo.

Robberson Steel Co.
P. O. Box 1675
Oklahoma City, Okla.

Roberts Construction Co.
1018 Trust Bldg.
Lincoln, Nebr.

Rocklin Mfg. Co.
110 So. Jennings St.
Sioux City 2, Iowa
Rockwell Engr. Co.
13500 S. Western Ave.
Blue Island, Ill.

Rosendahl Corp.
11933 Wilshire Blvd.
Los Angeles 25, Calif.

Ruscoe-Ajax Const. Co.
1107 - 19th St. N. W.
Washington 6, D. C.

Joseph T. Ryerson & Son
Attn: H. D. Huber
P. O. Box 8000-A
Chicago 80, Ill.

Schultz & Lindsay Constr. Co.
P. O. Box 487
Fargo, No. Dak.

Charles Simkin & Sons, Inc.
95 New Brunswick Ave.
Hopelawn, N. J.

A. O. Smith Corp.
Attn: C. F. Cullen
3533 N. 27th St. Gate 11
Milwaukee, Wisc.

Southwest Welding & Mfg. Co.
3201 W. Mission Road
Alhambra, Calif.

The Spero Electric Corp.
20500 So. Clair Ave.
Cleveland 17, Ohio

R. L. Spitaley Heating Co.
1200 W. Fort St.
Detroit 26, Mich.

St. Joseph Struct. Steel Co.
P. O. Box 68, Sta. A
St. Joseph, Mo.

Standard Steel Corp.
Cambridge Division
2 Industrial Park
Lowell, Mass

Standard Steel Corp.
P. O. Box 58252
Los Angeles 58, Calif.

The Stearns-Roger Mfg. Co.
Attn: C. Musso
P. O. Box 5370, Terminal Annex
Denver 17, Colo.

Struthers Wells Corp.
Pennsylvania Ave. W.
Warren, Pa.

M. M. Sundt Const. Co.
440 So. Park Ave.
Tucson, Ariz.

Superior Electric Const. Co., Inc.
346 Brunswick Ave.
Trenton, N. J.

Syro Steel Co.
1170 N. State St.
Girard, Ohio

Taylor Forge & Pipe Works
P. O. Box 485
Chicago 90, Ill.

Tellepsen Constr. Co.
P. O. Box 2536
Houston 1, Texas

Uni-Flex Mfg. & Engrg. Inc.
5545 E. Slauson Ave.
Los Angeles 22, Calif.

U. S. Engineering Co.
3433 Roanoke Road
Kansas City 11, Mo.

Universal Form Clamp
1238 N. Kostner Ave.
Chicago 51, Ill.

Utah Dredging Co.
P. O. Box 827
So. San Francisco, Calif.

Vinnell Co., Inc. Building Div.
Attn: J. R. William
1145 Westminster Ave.
Alhambra, Calif.

Vulcan-Cincinnati, Inc.
120 Sycamore St.
Cincinnati 2, Ohio

Wallace Process Piping Co., Inc.
4980 Monroe St.
Denver 16, Colo.

The Weitz Company, Inc.
406 Fleming Bldg.
Des Moines 9, Iowa

Western Contracting Corp.
400 Benson Bldg.
Sioux City, Iowa

Westinghouse Electric Corp.
117 No. 13th St.
Omaha 2, Nebr.

Westinghouse Elec. Corp.
A & C Sales
Gateway Center
Pittsburgh, Pa.

R. L. White Co.
824 "O" St.
Lincoln 8, Nebr.

Wiscombe Painting Co.
1610 No. Chicago St.
Salt Lake City, Utah

Alco Products Inc.
Attn: E. J. Brown
332 S. Michigan Ave.
Chicago 4, Ill.

Allied Structural Steel Cos.
20 No. Wacker Drive
Chicago 6, Illinois

Atlanta Engineering Co.
38 Park Row
New York 38, New York

Automatic Switch Co.
Florham Park, New Jersey

G. W. Ballard
1102 W.O.W. Bldg.
Omaha, Nebr.

Barco Mfg. Co.
500 N. Hough St.
Barrington, Ill.

Blaw-Knox Company
Equipment Divn.
P. O. Box 1193
Pittsburgh 30, Penna.

Bucyrus-Erie Co.
P. O. Box 56
So. Milwaukee, Wisc.

Cagle Limestone Co.
P. O. Box 546
Carthage, Mo.

Cargocaire Engineering Corp.
6 Chestnut St.
Amesbury, Mass.

The Stanley Carter Co.
Attn: K. J. Daly
125 S. Erie St.
Toledo, Ohio

Chicago Bridge & Iron Co.
7928 State Line Road
Kansas City 14, Mo.

Chicago Bridge & Iron Co.
Attn: Mr. L. C. Sloggett
1305 W. 105th St.
Chicago 43, Ill.

Cleveland Consolidated
P. O. Box 5097
Jacksonville 7, Fla.

T. J. Cope Div. Rome Cable Corp.
Third & Walnut Sts.
Collegeville, Penna.

Crane Co.
Chemical Industri Sales
Engrg Sales Dept.
4100 So. Kedzie Ave.
Chicago 32, Ill.

Eaton Metal Prods. Corp.
1303 Willis Ave.
Omaha 10, Nebr.

Electric Fixture & Supply Co.
1006 No. 20th St.
Omaha, Nebr.

Exide Industrial Division
Attn: Mr. C. H. Osborne
The Electric Storage Battery Co.
P. O. Box 5723
Philadelphia 20, Penna.

Fairbanks, Morse & Co.
J. W. Wright
902 Harney St.
Omaha 2, Nebr.

Ferro Fabricating Co.
3333 - 27th Avenue, No.
Birmingham 7, Ala

Five Boro Constr. Corp.
2 Lafayette St.
New York 7, New York

Flexonics Corp.
Maywood, Illinois

Flint Steel Corp.
P. O. Box 1289
Tulsa 1, Okla.

F. W. Forst Constr. Co.
3316 Pratt St.
Omaha 11, Nebr.

Sam Fox Sheet Metal Co.
4360 Vine St.
Denver 16, Colo.

Gable Electric Service Inc.
12808 Coit Road
Dallas 30, Texas

General Electric Co.
610 Electric Bldg.
Omaha, Nebr.

General Electric Co.
Industry Control Dept.
Veterans Facility Road
Salem, Virginia
Attn: T. K. Gibson

General Underground Structures
980 Simms
P. O. Box 648 Edgement Branch
Golden, Colo.

Gilmore-Skoubye
8275 San Leandro St.
Oakland 21, Calif.

Grafe-Callahan Const. Co.
714 West Olympic Blvd.
Los Angeles 15, Calif.

Gunite Concrete & Const. Co.
1301 Woodswether Road
Kansas City 5, Mo.

Hartman-Walsh
5078 Easton Ave.
St. Louis 13, Mo

Industrial Television, Inc.
3565 Locust St.
Denver 7, Colo.

Joseph Kopperman & Sons Inc.
308-16 New St.
Philadelphia 6, Penna.

E. V. Lane Corp.
P. O. Box 417
Palo Alto, Calif.

Layne-Western Co.
4430 Commercial
Omaha 11, Nebr.

C. H. Leavell & Co.
1900 Wyoming St.
El Paso, Texas

Lord Electric Co., Inc.
10 Rockefeller Plaza
New York 20, New York

The Lunkenheimer Co.
360 Annex Station
Cincinnati 14, Ohio

Lyman-Richey Sand & Gravel Corp.
750 Omaha Natl Bank Bldg.
Omaha 1, Nebr.

A. A. Mathews
117 East Colorado St.
Pasadena, Calif.

Midwest Asb. & Insul. Co.
1023 Harney St.
Omaha 2, Nebr.

Missouri Valley Steel Co.
Leavenworth, Kansas

Motorola C & E. Inc.
4501 West Augusta Blvd.
Chicago 51, Ill.

Natl. US Radiator Corp.
Div. of Crane Co.
P. O. Box 231
Middletown, Penna.

Natkin & Company
4001 Leavenworth St.
Omaha 5, Nebr.

Nebraska Sheet Metal Cont. Inc.
2622 No. 16th Street
Omaha 10, Nebr.

Northwood, Inc.
1768 E. Hastings St.
Vancouver 6 B.C., Canada

Paper, Calmenson & C
County Rd. B & Walnut St.
St. Paul 8, Minn.

Patent Scaffolding Co., Inc.
1520 Truman Road
Kansas City 6, Mo.

Paxton & Vierling Steel Co.
P. O. Box 1085
Omaha 1, Nebr.

Power Equipment Co.
8115 Gold St.
Omaha, Nebr.

Pudget Sound Bridge & Dry Dock Co.
2929 Sixteenth Ave. S. W.
Seattle 4, Wash.

Raymond International Inc.
140 Cedar St.
New York 6, N. Y.

D. H. Roberts & Co., Inc.
316-17 Shell Bldg.
Tulsa 1, Okla.

Scott Co.
1919 Market St.
Oakland, Calif.

Shaw & Estes, Inc.
P. O. Box 2399
Dallas, Texas

Sheffield Div. Armco Steel Corp.
Sheffield Station
Kansas City 25, Mo.

J. L. Simmons Company
Decatur, Illinois

Southwest Ornamental Iron Co.
1722 Tracy
Kansas City 8, Mo.

John W. Stang
2123 So. 56th St.
Omaha, Nebr.

Staven Engineering Co.
P. O. Box 508
Rapid City, South Dak.

The Steel Construction Co.
5300 N.W. Front Ave.
Portland 10, Oregon

Telautograph Corp.
8700 Bellanca Ave.
Los Angeles 45, Calif.

Truscon Steel Div.
Attn: Mr. A. B. Greene
1315 Albert St.
Youngstown 1, Ohio

Tyler Dawson Supply Co.
6310 E. 13th
Tulsa, Okla.

Vickers Incorporated
172 E. Aurora St.
Waterbury 20, Conn.

Wickes Engineering & Const. Co.
P. O. Box 692
Des Moines, Iowa

Yuba Mfg. Div.
Attn: Lloyd Freeman
675 East "H" St.
Benicia, Calif.

ABC Electric Company
1012 No. 25th St.
Lincoln 3, Nebr.

Airtex Dynamics, Inc.
18201 So. Santa Fe
Compton, Calif
Attn: R. F. Ullman

Alliance Mechanical Cont.
5801 W. Jefferson Blvd.
Los Angeles 16, Calif.

American Steel & Iron Works
4245 Fox St.
Denver 16, Colo.

Anaconda Wire & Cable Co.
817 Fleming Bldg.
Des Moines 9, Iowa

Anderson Equip. Co., Inc.
13th & Farnam Sts.
Omaha, Nebr.

Arrowhead Products
2300 Curry St.
P. O. Box 1890
Long Beach 1, Calif.

Atwood & Morrill Co.
48 Loring Ave.
Salem, Mass.

Aycock, Inc.
P. O. Box 277
Camp Hill, Penna.

B & B Engineering & Supl. Co.
P. O. Box 5052 T.A.
Denver, Colorado

L. G. Barcus & Sons, Inc.
1430 State Ave.
Kansas City 2, Kansas

Beacon Steel Corp.
11810 Center St.
Hollydale, Calif.

Beagle Chilcutt Painting Co.
P. O. Box 215
Kansas City 41, Mo.

Boring Tunneling Co of Am.
2902 Ricks
Houston, Texas

Commonwealth Elec., Inc.
2627 Cuming St.
Omaha 31, Nebr.

Cook Electric Co.
3412 River Road
Franklin Park, Ill.

Corn States Metal Fabricators
1323 Maple St.
West Des Moines, Iowa

CRIPCO
Box 7325
Long Beach 7, Calif.

Enterprise Electric Co.
1103 Farnam St.
Omaha 8, Nebr.

Federal Ins. Co.
320 California St.
San Francisco 4, Calif.

Federal Pacific Electric Co.
1601 N. 34th St.
Omaha 11, Nebr.

Fischbach & Moore, Inc.
P. O. Box 7728
Dallas, Texas

Flexonics Corp.
Attn: Mr. Elmer Olson
102 West First St.
Rock Falls, Ill.

Fredericksen & Kasler
Box 176
Fontana, Calif.

Frisch Corp.
1400 Wabansia Ave.
Chicago 22, Ill.

Gate City Steel Works, Inc.
11th & Seward Sts.
Omaha 2, Nebr.

General Electric Supply Co.
914 No. 18th St.
Omaha, Nebr.

The Globe Company
400 So. Princeton Ave.
Chicago 9, Illinois

S. J. Groves & Sons Co.
1104 W. Reynolds St.
Springfield, Ill.

Hansen-Kashmer Co.
General Delivery
Rapid City, So. Dakota

Hersey-Sparling Meter Co.
6 E. Eleventh St.
Kansas City 6, Mo.

Ingersoll-Rand Co.
1641 Blake St.
Denver 2, Colo.

Jackson & Slack Ptg. Co.
4529 No. 49th St.
Omaha, Nebr.

E. K. Jenkins, Inc.
730 N. Main St.
Wichita 5, Kansas

Herrick L. Johnston, Inc.
659 Marion Road
Columbus 7, Ohio

Joy Manufacturing Co.
560 W. Washington Blvd.
Chicago 6, Illinois

Kansas City Struct Steel Co.
21st & Metropolitan Ave.
Kansas City 6, Kansas

Kieley & Mueller, Inc.
64 Genung St.
Middleton, New York

The Korfund Co., Inc.
48-15 Thirty-Second Place
Long Island City 1, N. Y.

Lincoln Steel Corp.
315 West "O" St.
Lincoln 1, Nebr.

Maclean-Grove & Co., Inc.
400 Madison Ave.
New York 17, New York

Mason-Neilan Div.
Worthington Corp.
2822 E. Olympic Blvd.
Los Angeles 23, Calif.

Mason-Neilan Div.
Worthington Corp.
Mahatan St.
Norwood, Mass
Attn: J. F. Morgan

Mathews Industrial Piping Corp.
2704 East Fremont
New York 61, New York
Attn: Mr. Jerry Bell

Meehleis Steel Co.
5400 Alcoa Ave.
Vernon 58, Calif.

Modern Welding Co.
Burlington, Iowa

Montefusco
1615 S.W. Adams St.
Peoria, Illinois

Murphy Bros.
E. 3728 Broadway
Spokane, Wash.

A. Nabekowski Co.
129 Milan Ave.
Amherst, Ohio

Gust. K. Newberg Const. Co.
2040 N. Ashland Ave.
Chicago 14, Illinois

F. L. O'Neill
5039 Woolworth Ave.
Omaha, Nebr.

Pennsylvania Pump & Compressor Co.
Easton, Penna.

Power Engineering Co.
P. O. Box 146, 623 Jackson St.
Sioux City, Iowa

Ora E. Salyer, Inc.
8450 E. Las Tunas Dr.
San Gabriel, Calif.

Security Valve Corp.
909 El Centro
So. Pasadena, Calif.

Southwestern Engr. Co.
P. O. Box 3431
Tulsa 10, Okla.

Spring City Elec. Mfg. Co.
Hall & Main Sts.
Spring City, Penna.
Attn: Morton Kanter

Thompson Fabricating Co.
P. O. Box 6500
Tarrant 7, Alabama

Traylor Bros., Inc.
Evansville 12, Indiana

U. S. Steel Supply
P. O. Box 7310
Chicago 30, Ill.

Utah Const. & Mining Co.
100 Bush St.
San Francisco 4, Calif.

W. C. Wiedenmann & Son
1810-24 Harrison St.
Kansas City 8, Mo.

Yonkers Constructing Co., Inc.
969 Midland Ave.
Yonkers 4, New York

F. E. Young Constr. Co.
P. O. Box 2872
San Diego 12, Calif.

AGENCIES

RESIDENT ENGINEER, LINCOLN RES OFFICE
CORPS OF ENGINEERS
BOX 1744
LINCOLN, NEBRASKA

Area Engineer, Denver Area
Corps of Engineers
P. O. Box 475, Aurora Br.
Denver, Colo.

Assoc. Gen. Contr. of Am.
425 Trust Bldg.
Lincoln, Nebr.

Area Engineer, Omaha Area
Corps of Engineers
P. O. Box 1620
Mead, Nebr.
Attn: Mr. Wolfe

Chief of Engineers ATTN - ENGMG
Dept. of the Army
Building No. T-7
Washington 25, D. C.

District Engineer, Chicago Dist.
Corps of Engineers
475 Merchandise Mart
Chicago 54, Ill.

District Engineer, Kansas City Dist.
1800 Federal Office Bldg.
Kansas City 6, Mo.

District Engineer, Rock Island Dist.
Corps of Engineers
Clock Tower Bldg.
Rock Island, Ill.

District Engineer, St. Paul Dist.
Corps of Engineers
1217 U. S. Post Office
St. Paul, Minn.

District Engineer, Little Rock Dist.
Corps of Engineers
300 Broadway
Little Rock, Ark.

District Engineer, Los Angeles Dist.
Corps of Engineers
715 Figueroa St.
Los Angeles, Calif.

District Engineer, Jacksonville Dist.
Corps of Engineers
575 Riverside Ave.
Jacksonville, Fla.

District Engineer, Ft. Worth Dist.
Corps of Engineers
100 W. Vickery
Ft. Worth, Texas

F. W. Dodge Corp.
622 Securities Bldg.
Des Moines 9, Iowa

Lincoln Builders Bureau
120 No. 20th
Lincoln 8, Nebr.

Midwest Contractors Magazine
2537 Madison Ave.
Kansas City 8, Mo.

Mrs. W. C. Forsberg,
Midwest Contr Mag
3558 So. 51st St.
Lincoln, Nebr.

Omaha Builders Exchange
2565 St. Marys Ave.
Omaha, Nebr.

Plan Service of Arizona
3501 North 16th St.
Phoenix, Ariz.

Procurement Information Center
Office of Under Secy. of the Army
12th St. & Pennsylvania Ave., N.W.
Washington 25, D. C.

Resident Engineer
Corps of Engineers
Box 2048
Wichita Falls, Texas

Master Builders of Iowa
912 Walnut
Des Moines, Iowa

U. S. ARMY CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
5651 West 96th Street
Los Angeles 45, California

ENGMA-AB-3

ATLAS F MEMORANDUM
NUMBER 61-6

ISSUED: 20 February 1961
EXPIRES: 28 February 1962

SUBJECT: Surveillance by Integrating Contractor

1. Purpose and Scope: This Memorandum transmits the established policy for and defines the scope of surveillance to be performed by the Integrating Contractor during the facility construction phase of Atlas F ICBM operational bases. This Memorandum concerns Atlas F Directorate (A-F-D) and Area Office personnel and has been concurred in by AFBMC.

2. Reference: Joint BMC/Atlas F agreement "Policy on Surveillance by Integrating Contractor on Atlas F ICBM Pre-EOD Facility Construction" dated 15 February 1961 (Inclosure 1).

3. Implementation: Joint inspection and validation activities of the Area Engineer and Integrating Contractor will be coordinated by the SATAF Commander in accordance with the attached joint agreement between the Atlas F Construction Director and the AFBMC.

4. Compliance: The Construction Branch, A-F-D, will be responsible to monitor compliance with this agreement during field visits and coordinate technical assistance required at Directorate level.

FOR THE DIRECTOR:

G. J. Byrnes

G. J. BYRNES
Deputy Director
Atlas F Construction Directorate

1 Incl
as

DISTRIBUTION:
5 ea - Constr Br, A-F-D
2 ea - Other Branches
25 ea - Area Offices

POLICY ON SURVEILLANCE BY INTEGRATING CONTRACTOR
ON ATLAS F ICBM PRE-BOD FACILITY CONSTRUCTION

15 February 1961

1. General

The policy outlined herein relative to surveillance by the Integrating Contractor on Atlas F ICBM Pre-Bod Facility Construction will be followed hereafter at all operational bases.

2. Purpose

The purpose of this policy is to define the scope of surveillance to be performed by the Integrating Contractor during the facility construction phase and to minimize duplication and overlap with the responsibilities of the Construction Agency.

3. Definitions

The following definitions are established:

a. Surveillance. The routine observation that is normally exercised by an owner, in this instance the Air Force, over the activities of agents he employs for design and construction services. It includes on-the-site observation, and inquiry into the status of the project being carried out by the Construction Agency, in this instance the Corps of Engineers, U.S. Army. Such surveillance will not duplicate the functions of inspection and contract administration which are the responsibility of the Construction Agency.

b. Inspection. Inspection is the action and responsibility of the Construction Agency to insure clear and critical review of every phase of the construction work; to ascertain quality or state of work; to determine compliance with plans and specifications; to determine adherence to contract provisions. This includes among other functions:

(1) Checking layout of construction in the field

(2) Checking shop drawings

(3) Inspecting quality of workmanship and materials

(4) Insuring construction conformity with plans and specifications, and required performance of installed equipment.

(5) Performing laboratory tests and analyses of materials

(6) Completing and submitting field and progress reports

Incl 1

(7) Checking monthly and final estimates which are applied as a basis for contractor payment.

(8) Preparing final inspection reports.

Inspection and construction supervision is a direct responsibility of the Construction Agency and is distinctly separate from the surveillance normally exercised by the owner.

c. Validation. Validation shall consist of assuring, in accordance with an approved separately documented procedure, that the respective systems and/or items identified by the Using Agency, are installed and will function in accordance with the applicable plans and specifications. Unless otherwise directed by Headquarters, Ballistic Missiles Center, all validations shall be a joint effort of the Construction Agency, Integrating, and Construction Contractors.

d. Interface. Interface is the critical area at the termination of a system and/or structure installed during facility construction to which the weapons system Integrating or Associate Contractor connects for system or facility continuation.

4. Responsibilities.

a. SATAF Commander. The SATAF Commander has overall responsibility for implementation of this policy, and as representative of the Using Agency is specifically responsible for all surveillance of facility construction.

b. Construction Agency (Corps of Engineers). The Corps of Engineers, U.S. Army, as the official government Construction Agency is responsible for all facility construction inspection and validation for which they are the contracting officer. Notwithstanding this fact, it is in the best interest of the government that interfaces and certain areas of facility construction be jointly inspected and validated by the Construction and Integrating Contractors to minimize possibilities of costly and time consuming corrective actions. These areas are identified as those of:

(1) Interfaces

(2) Embedded Hardware

(3) Crib alignment and suspension

(4) PLS installation and testing

(5) Sub-systems where validation procedures are documented.

(6) Electrical bonding and grounding for silo complex

(7) Launch platform drive system

(8) Other areas specifically directed by Hq, BMC

c. Integrating Contractor (Convair Astronautics Division). As the contractor responsible for the mating and proper functioning of the weapon system the Integrating Contractor shall participate in joint inspection and validation in those interface and facility areas referenced in para 4b above, to assure compatibility with the I & C phase of facility and weapon integration. When requested by the SATAF Commander, the Integrating Contractor shall perform surveillance as defined in para 3a above.

d. Construction Contractor. The construction contractor is required by paragraph 9b of the General provisions of the contract to cooperate on inspection and validation procedures.

5. Implementation

a. The SATAF Commander shall coordinate all surveillance, joint inspection and validation activities of the Area Engineer and Integrating Contractor.

b. The Integrating Contractor will participate in joint inspection and validation for those areas of facility construction cited in paragraph 4b above critical to their I & C responsibilities, and when requested, perform surveillance as defined in para 3a above.

c. The respective Area Engineer, or his duly authorized representative, as the official government Construction Agent, will schedule and conduct all joint team inspection and validation activities.

d. All unresolved problems arising in the field shall be reported to the SATAF Commander for resolution. Problems that cannot be resolved by the SATAF Commander shall be referred to Headquarters Ballistic Missiles Center for resolution.

e. The Area Engineer, or his duly authorized representative, is the sole official point of contact with the Construction Contractor and shall prepare the official construction progress report.

f. The Integrating Contractor will continue formal surveillance reporting only in those areas referenced in paragraph 4b above.

6. Concurrence. This policy has been coordinated with and has concurrence of BMC and CEBMCO. The Integrating Contractor is being advised of this policy statement through procurement channels.

Malcolm K. Andrews, 2d Col.

BMC
For WILLIAM T. ENSLEY
Colonel, USAF
Chief, Atlas SPO

W. W. Wilson

CEBMCO
W. W. WILSON
Colonel, C. E.
Director, Atlas F Construction

MEASUREMENTS OF GROUND RESISTANCES

Considerable time was spent in checking the individual ground rod resistance that were placed in the floor and walls of the silo and the floor of the LCC.

The readings of the resistance as obtained are given in Annex R.

Lincoln Atlas Sites
Lincoln, Nebraska

GROUNDING SYSTEM

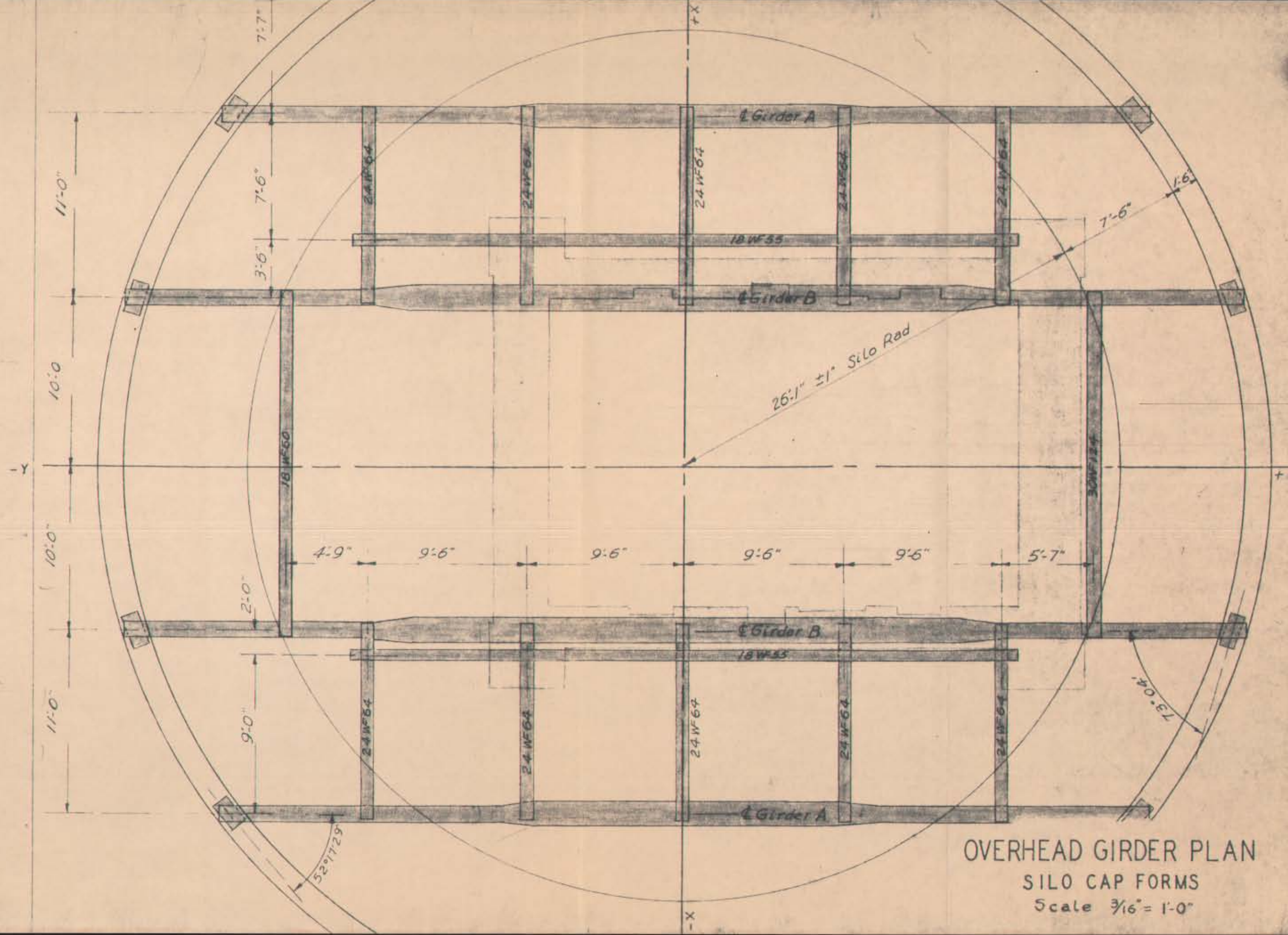
Power Engineering Co., Inc.
September 13, 1961

	Rod No.	Rod Location	Site #1	Site #2	Site #3	Site #4	Site #5	Site #6	Site #7	Site #8	Site #9	Site #10	Site #11	Site #12	
1	A	Horizontal Rod	1.0 Ohms	.2 Ohms	4 Ohms	.2 Ohms	4.75 Ohms	1½ Ohms	4.0 Ohms		3.0 Ohms	1.0 Ohms	.2 Ohms	4.75 Ohms	1
2	B	"	1.0 "	.25 "	1.5 "	.2 "	4.75 "	.2 "	5.0 "		4.0 "	1.0 "	8.5 "	5.0 "	2
3	J6	"	1.0 "	.2 "	4.0 "	.3 "	4.5 "	.2 "	7.0 "		6.0 "	2.5 "	6.2 "	4.0 "	3
4	6	"	1.5 "	.2 "	2.0 "	.2 "	4.25 "	.5 "	4.0 "		2.5 "	1.5 "	.1 "	4.0 "	4
5	J2	"	1.5 "	.175 "	1.0 "	.2 "	4.5 "	.3 "	4.0 "		3.5 "	1.0 "	23.0 "	4.0 "	5
6	D	"	1.5 "	.175 "	2.0 "	.2 "	2.5 "	.4 "	5.0 "		6.0 "	1.0 "	2.0 "	5.0 "	6
7	J2	"	2.0 "	.1 "	5.0 "	.2 "	4.5 "	10.0 "	4.0 "		4.0 "	1.5 "	2.0 "	4.0 "	7
8	E	"	1.0 "	.15 "	5.0 "	.2 "	4.5 "	.2 "	4.0 "		5.0 "	1.5 "	.2 "	5.0 "	8
9	F	"	1.5 "	.175 "	4.5 "	.2 "	4.5 "	.3 "	5.0 "		3.0 "	1.5 "	.2 "	6.0 "	9
10	J3	"	3.0 "	.175 "	5.0 "	.2 "	4.6 "	.2 "	5.0 "		4.0 "	1.5 "	26.0 "	.2 "	10
11	G	"	2.5 "	.025 "	.5 "	.2 "	5 "	1.0 "	5.0 "		2.0 "	1.0 "	.1 "	24.0 "	11
12	J4	"	2.4 "	.15 "	5.0 "	.2 "	4.6 "	1.0 "	5.0 "		5.0 "	1.0 "	.1 "	4.0 "	12
13	H	"	2.5 "	.15 "	4.0 "	.2 "	4.5 "	.5 "	4.0 "		4.0 "	1.5 "	.1 "	4.0 "	13
14	J5	"	2.0 "	.2 "	4.0 "	.2 "	5 "	.2 "	5.0 "		2.5 "	1.5 "	.1 "	4.0 "	14
15	A	Silo Bottom Rods	4.0 "	1.5 "	11.0 "	23.0 Ohms	4.5 "	3.0 "	3.0 "	7.0 Ohms	4.0 "	2.0 "	3.0 "	16.0 "	15
16	B	"	4.0 "	1.0 "	16.0 "	23.0 "	5 "	7.0 "	3.0 "	15.5 "	3.0 "	2.0 "	3.0 "	16.0 "	16
17	J6	"	6.0 "	2.0 "	18.0 "	20.0 "	4.75 "	4.0 "	3.0 "	16.0 "	6.0 "	2.0 "	9.0 "	16.0 "	17
18	C	"	8.0 "	2.0 "	17.0 "	23.0 "	5.5 "	5.0 "	3.0 "	9.0 "	3.0 "	2.5 "	3.5 "	8.0 "	18
19	J1	"	12.0 "	2.5 "	16.0 "	26.0 "	6.5 "	6.0 "	3.0 "	10.5 "	3.5 "	2.5 "	3.5 "	8.0 "	19
20	D	"	11.0 "	2.0 "	15.0 "	27.0 "	6 "	5.0 "	3.0 "	10.0 "	4.0 "	2.5 "	4.0 "	8.0 "	20
21	J2	"	6.0 "	1.5 "	14.0 "	24.0 "	7 "	4.0 "	3.0 "	9.0 "	4.0 "	3.0 "	3.0 "	16.0 "	21
22	E	"	7.0 "	3.0 "	15.0 "	23.0 "	6.5 "	3.0 "	3.0 "	10.0 "	5.0 "	2.0 "	2.0 "	16.0 "	22
23	F	"	6.0 "	3.0 "	13.0 "	20.0 "	5.5 "	3.0 "	3.0 "	25.0 "	3.5 "	2.5 "	2.5 "	16.0 "	23
24	J3	"	10.0 "	2.0 "	14.0 "	18.0 "	5.5 "	5.0 "	3.0 "	12.0 "	4.0 "	3.0 "	4.0 "	16.0 "	24
25	G	"	12.0 "	2.0 "	14.0 "	22.0 "	5 "	6.0 "	3.0 "	11.0 "	6.0 "	3.0 "	4.0 "	16.0 "	25
26	J4	"	10.0 "	2.5 "	13.0 "	23.0 "	5.5 "	4.0 "	3.0 "	10.0 "	5.0 "	2.0 "	3.5 "	16.0 "	26
27	H	"	11.0 "	2.5 "	11.0 "	24.0 "	5 "	5.0 "	3.0 "	8.5 "	4.5 "	2.0 "	3.0 "	8.0 "	27
28	J5	"	9.0 "	2.0 "	12.0 "	23.0 "	5 "	7.0 "	3.0 "	8.0 "	2.5 "	1.0 "	3.0 "	16.0 "	28
29		Launch Control Center	2-4 "	3-4 "	3-4 "	2-4 "	4-5 "	8-11 "	6-9 "	5-10 "	2-5 "	2-4 "	2-3 "	3-4 "	29
30															30
31															31
32															32
33															33
34															34
35															35
36															36
37															37
38															38
39															39

Method of Placement Position Reading of Horizontal Rods.

ANNEX 5

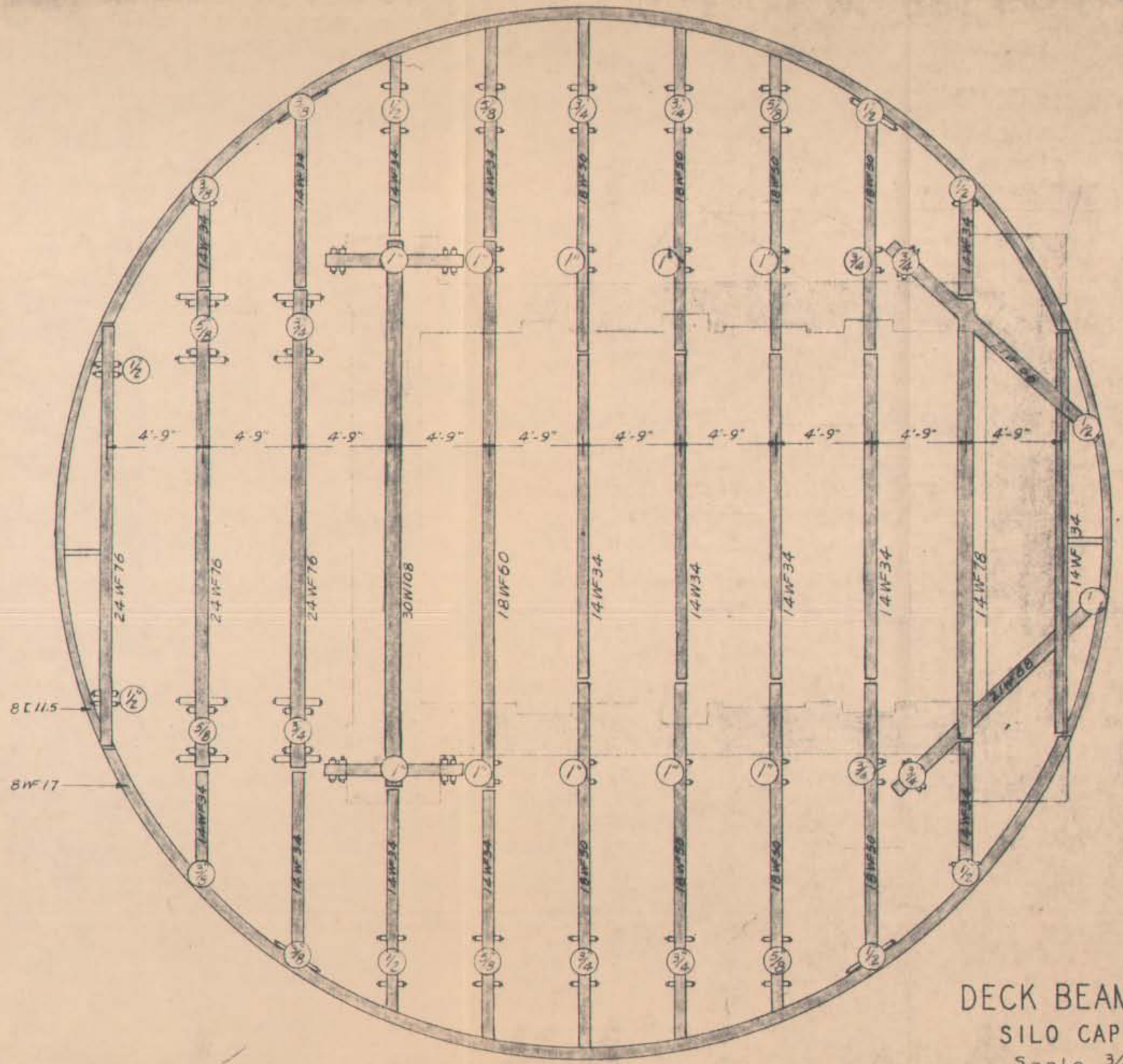
Series of prints showing rate and distribution of concrete placement and deflections on the forms for Silo Cap as discussed in VIII - 5.



OVERHEAD GIRDER PLAN

SILO CAP FORMS

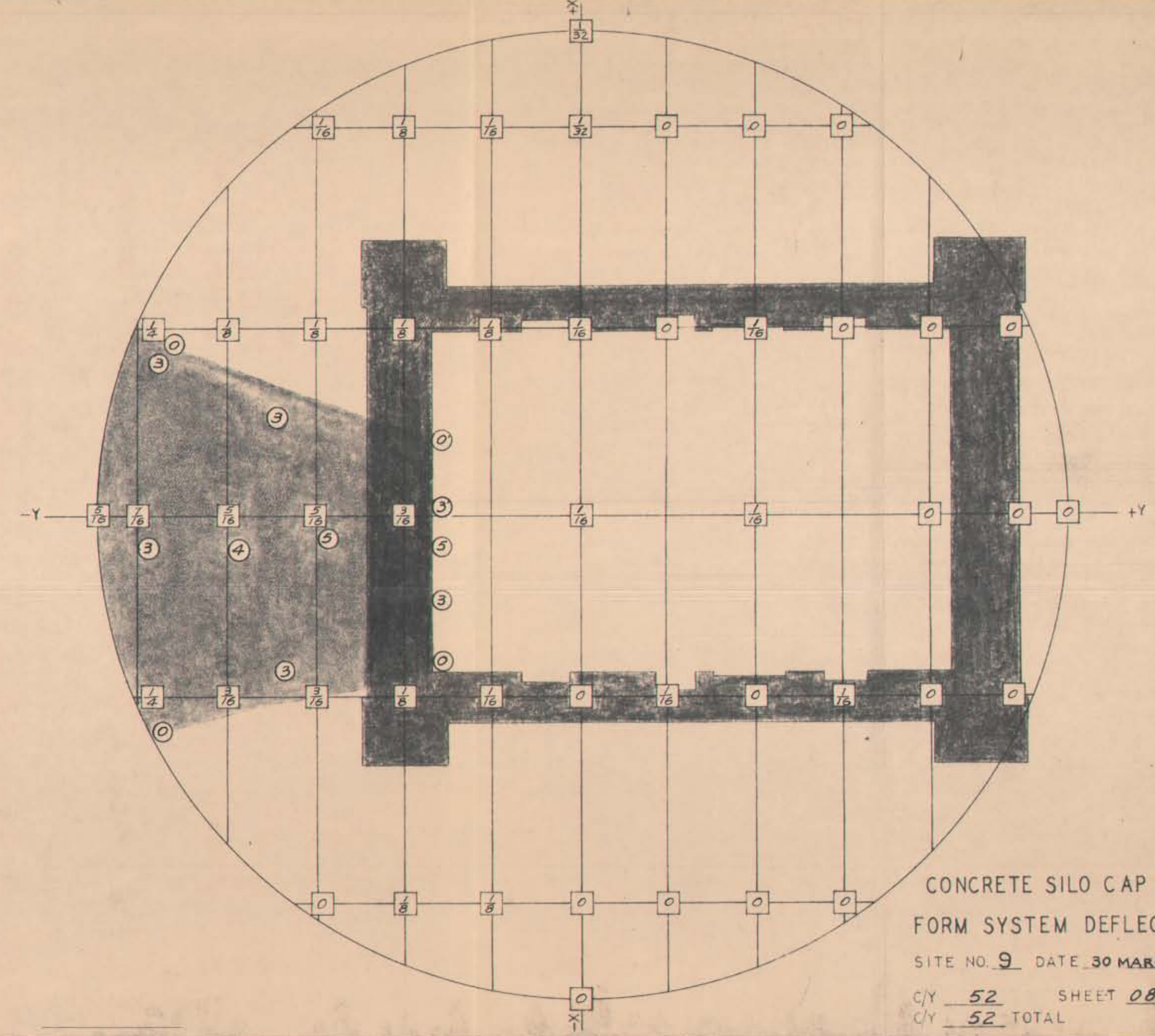
Scale 3/16" = 1'-0"



DECK BEAM PLAN

SILO CAP FORMS

Scale 3/16" = 1'-0"



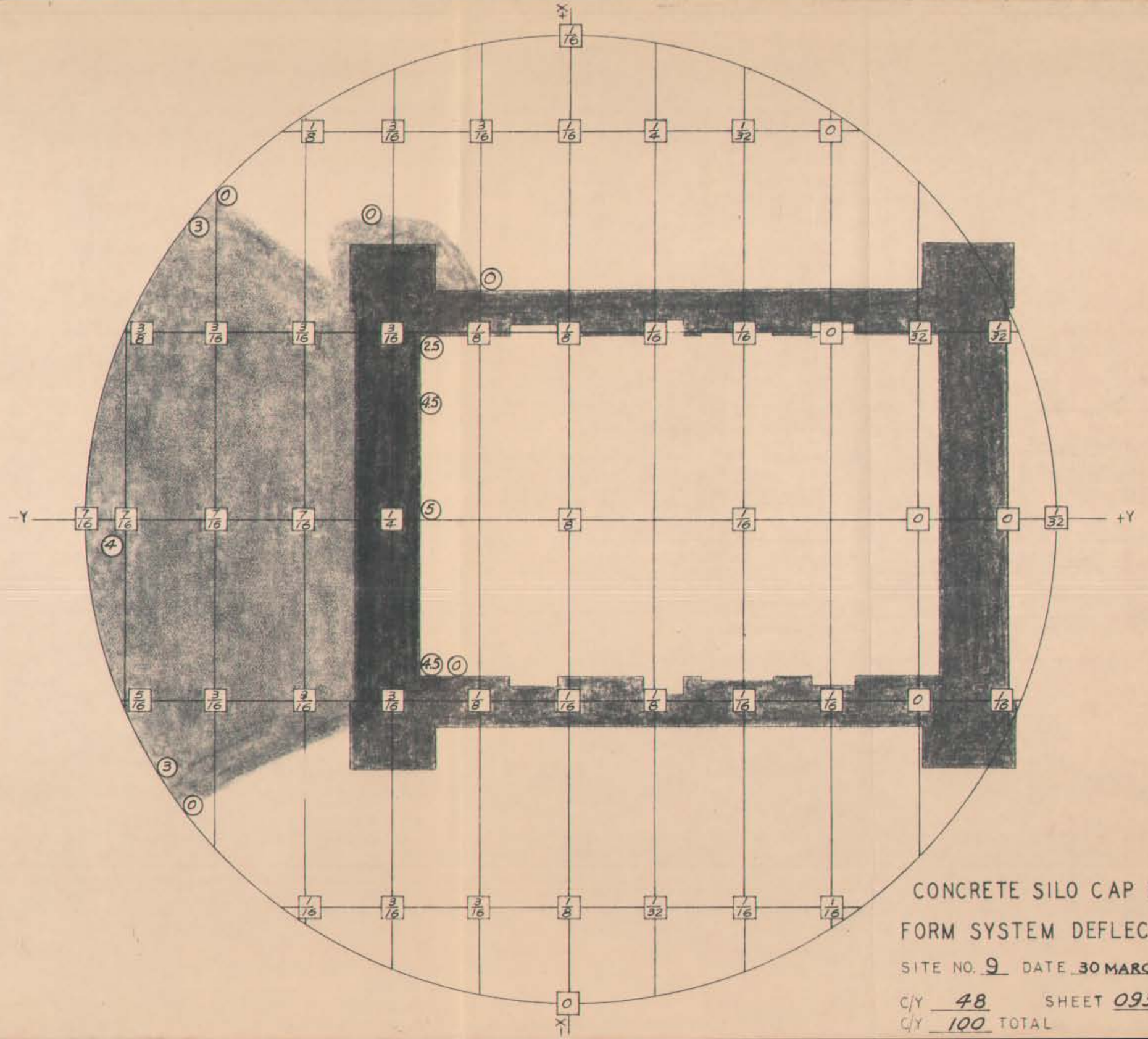
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 52 SHEET 0830 HRS

C/Y 52 TOTAL



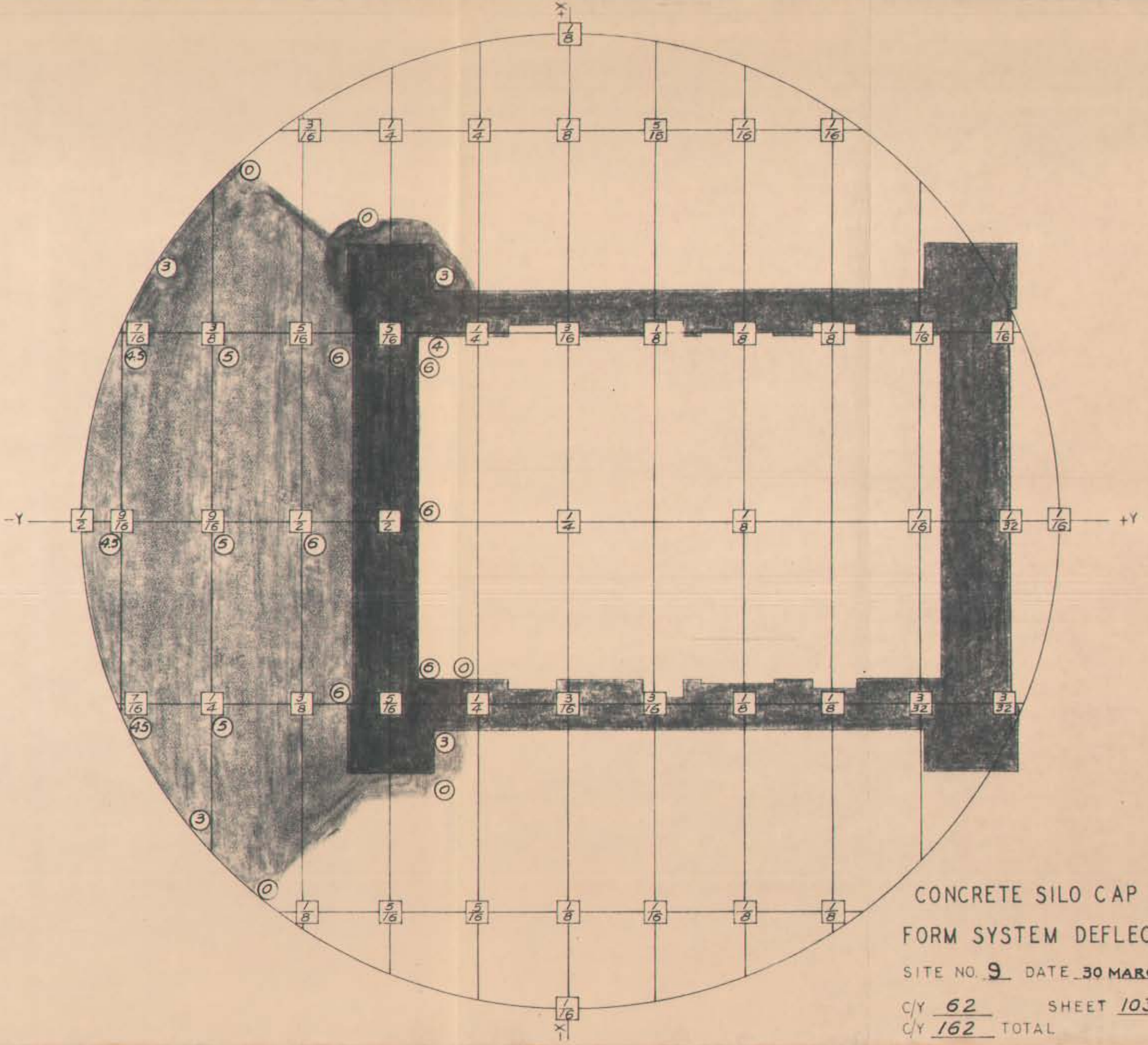
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 48 SHEET 0930 HRS

C/Y 100 TOTAL



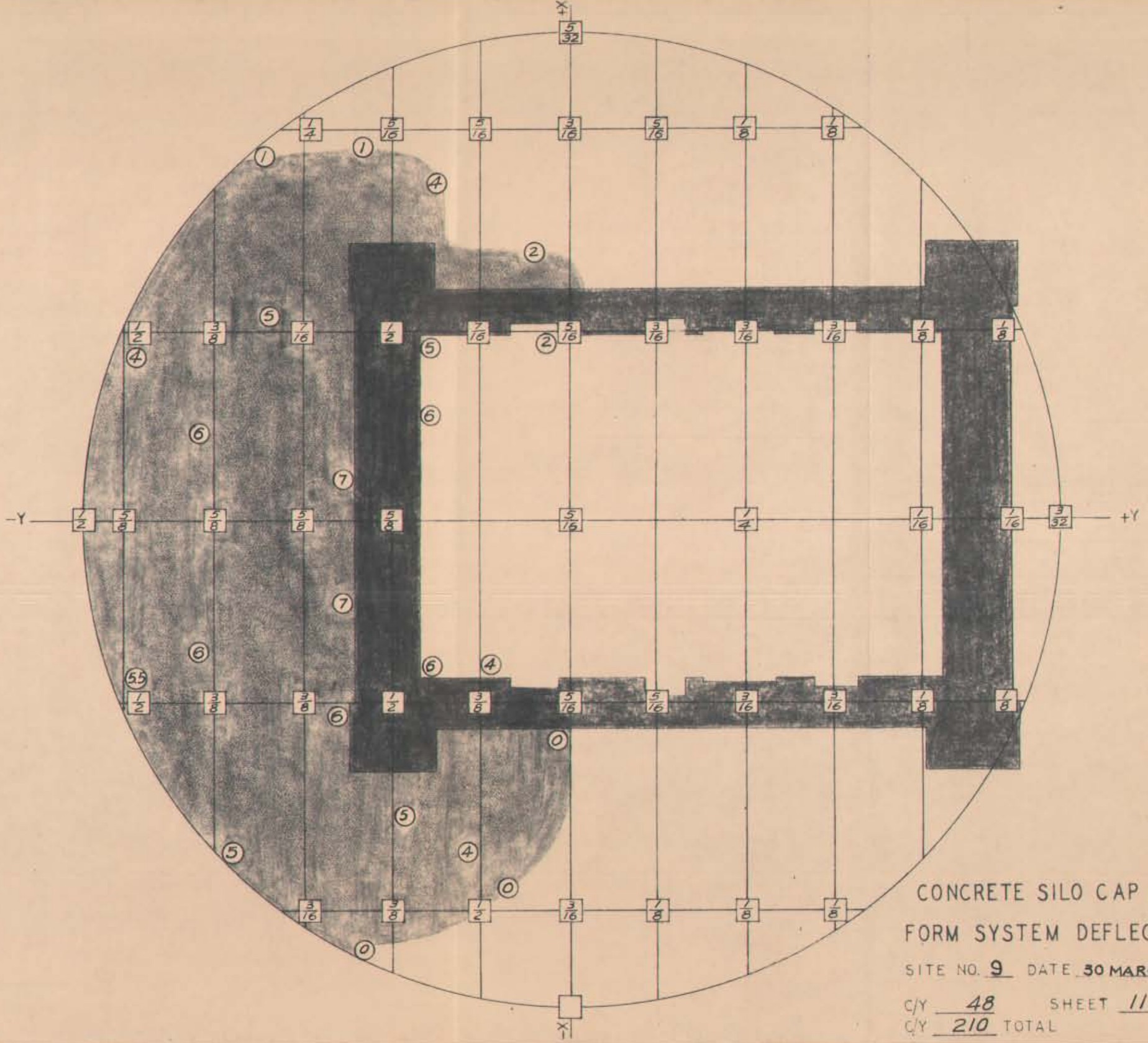
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 62 SHEET 1030 HRS

C/Y 162 TOTAL



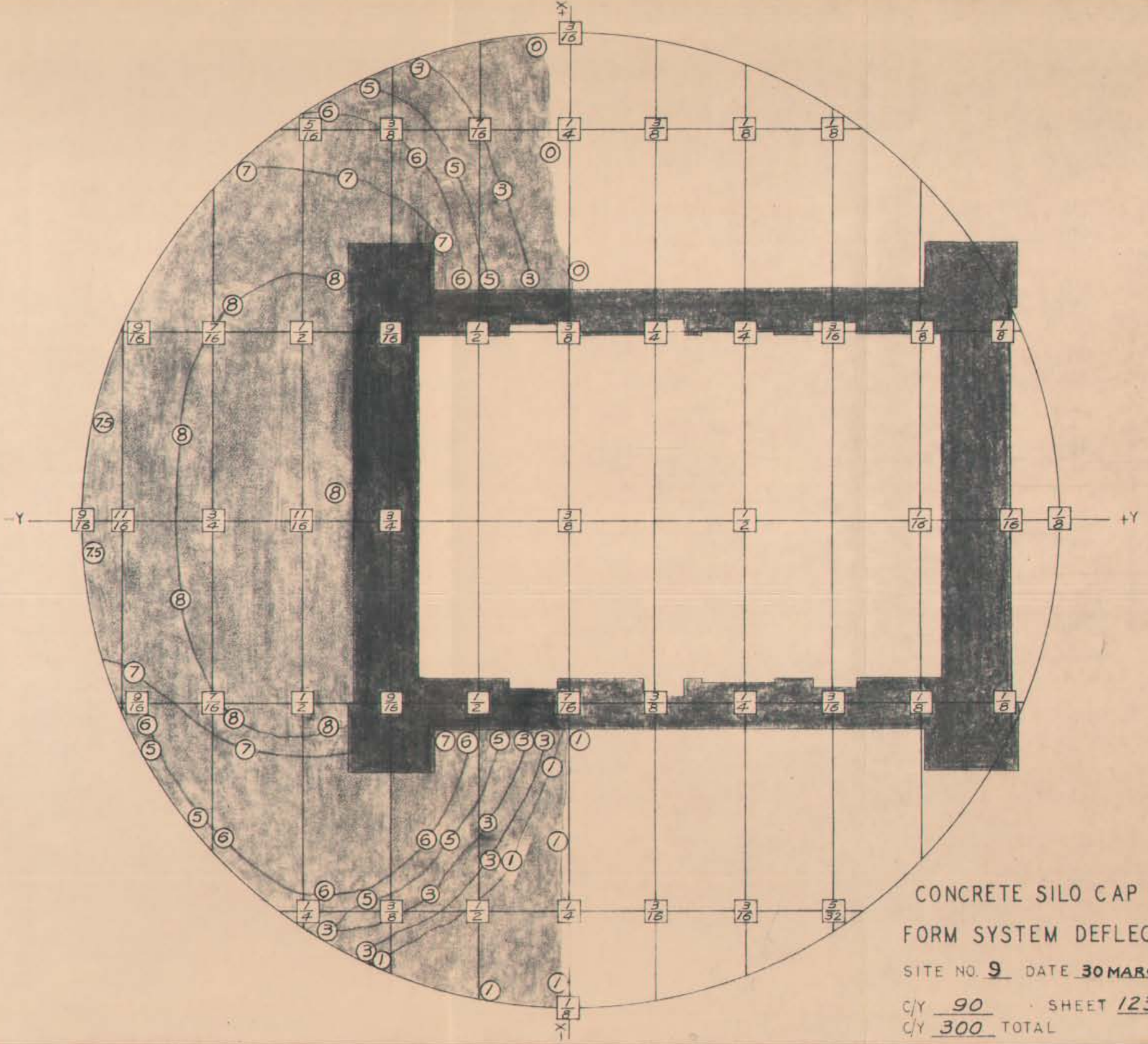
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 48 SHEET 1130 HRS

C/Y 210 TOTAL



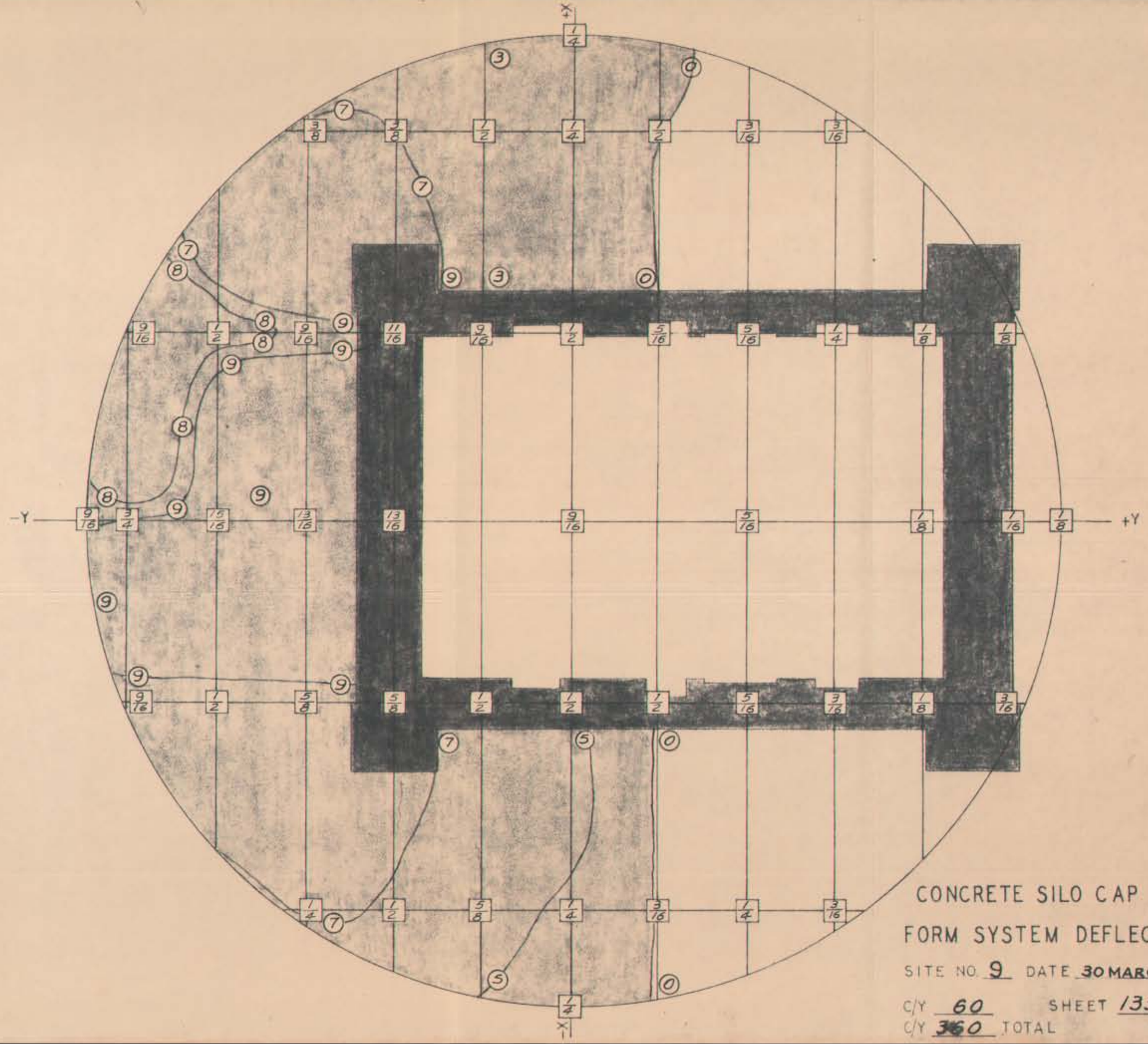
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 90 SHEET 1230 HRS

C/Y 300 TOTAL



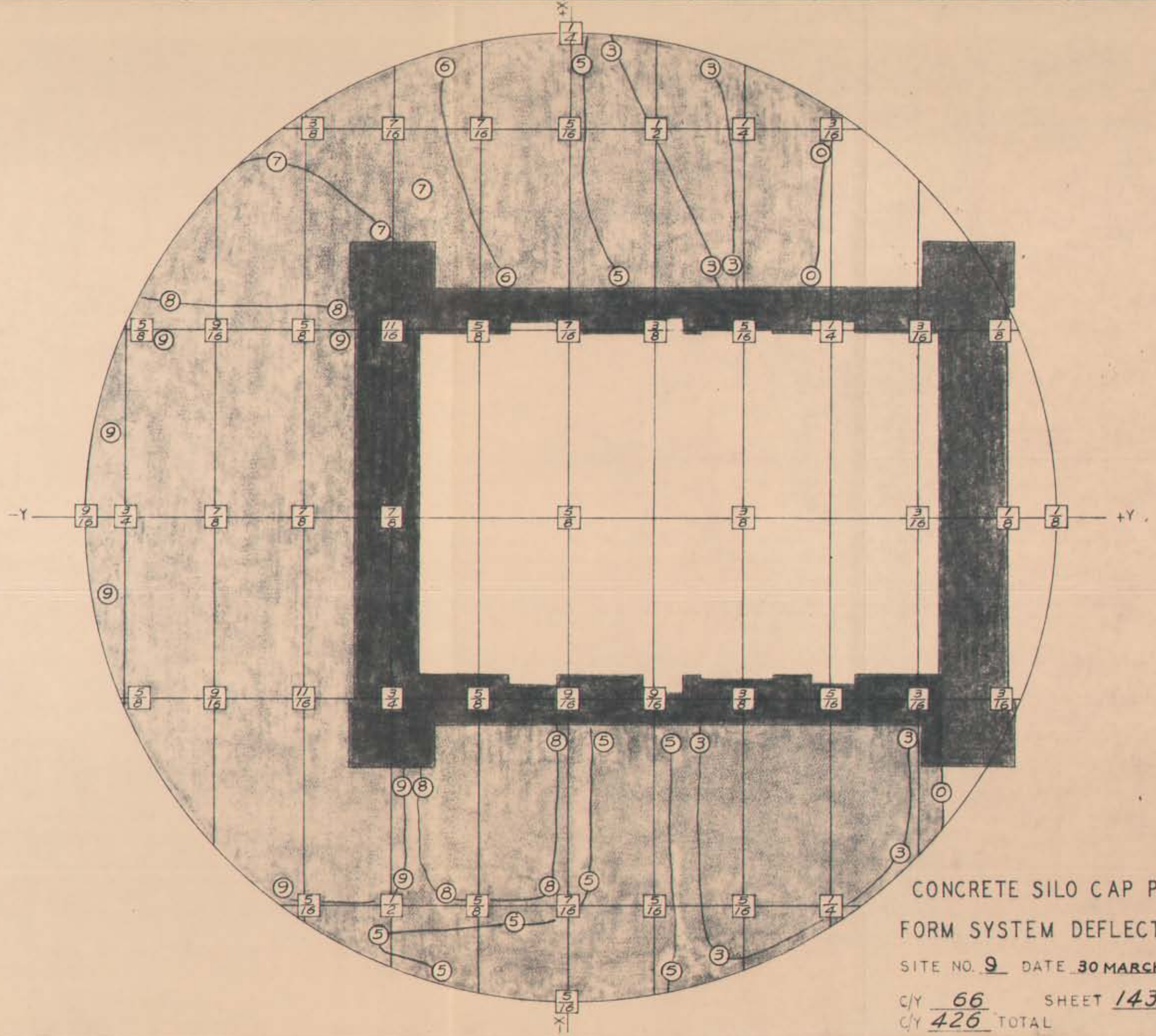
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 60 SHEET 1330 HRS

C/Y 360 TOTAL



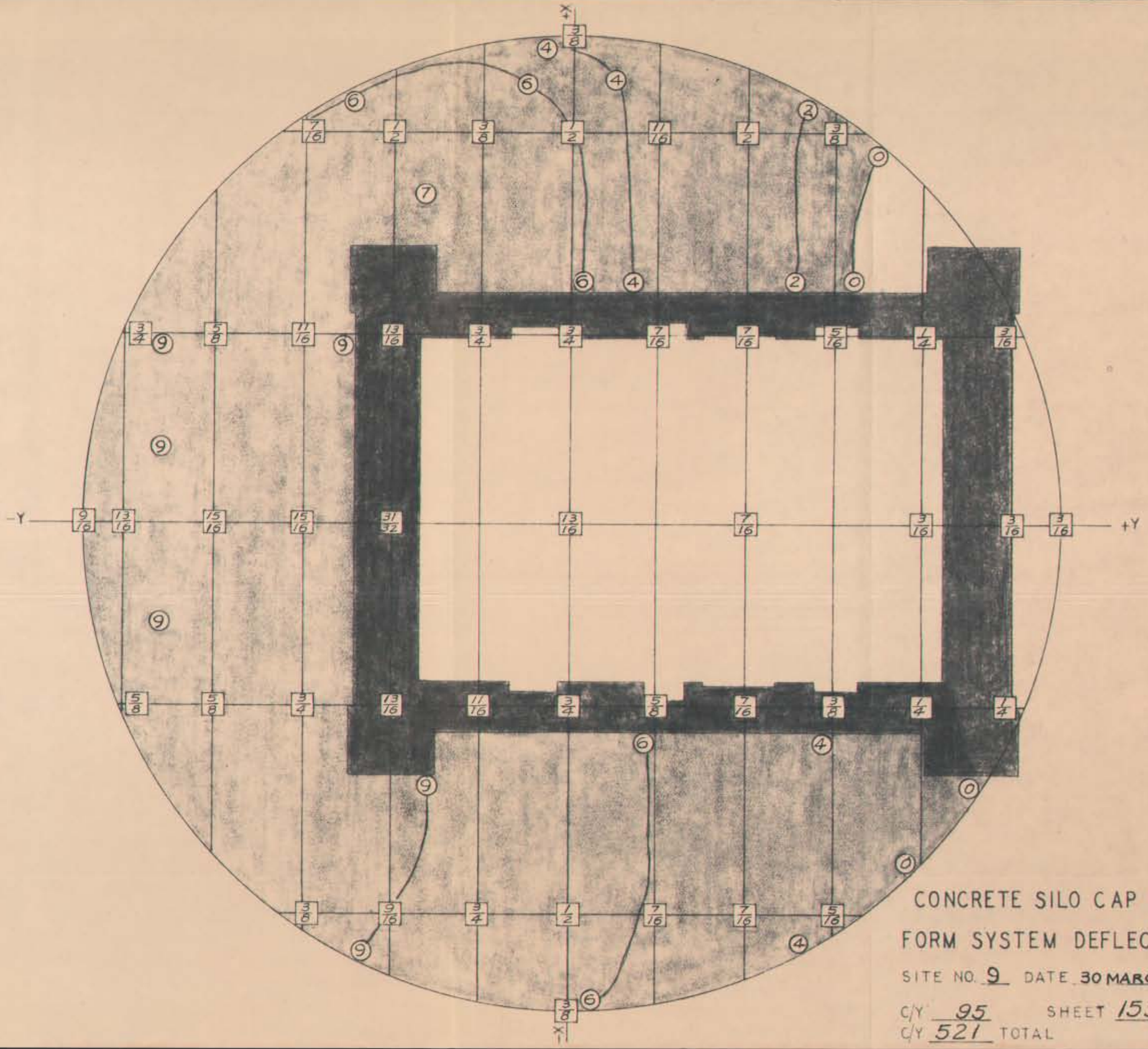
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 66 SHEET 1430 HRS

C/Y 426 TOTAL



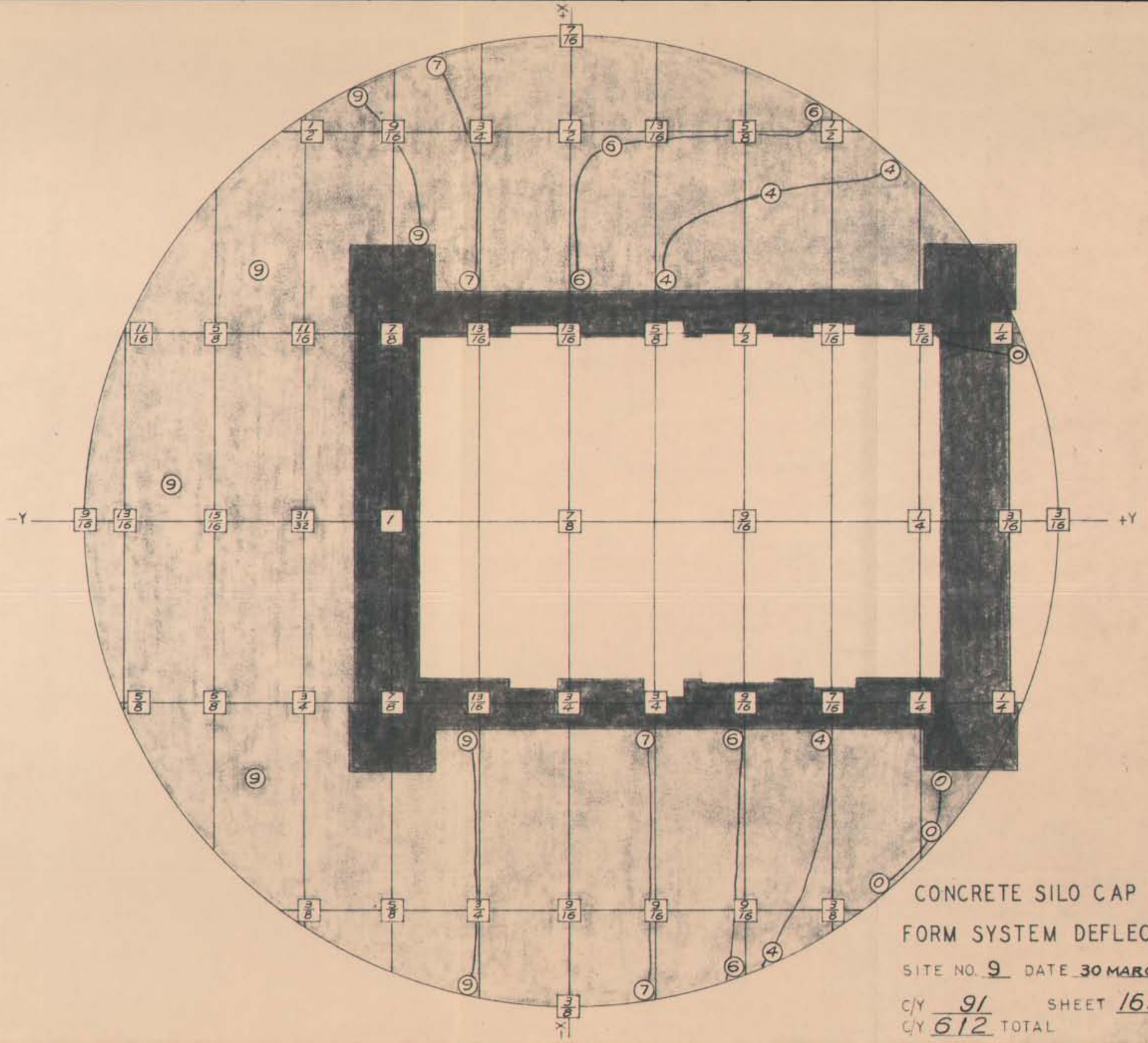
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 95 SHEET 1530 HRS

C/Y 521 TOTAL



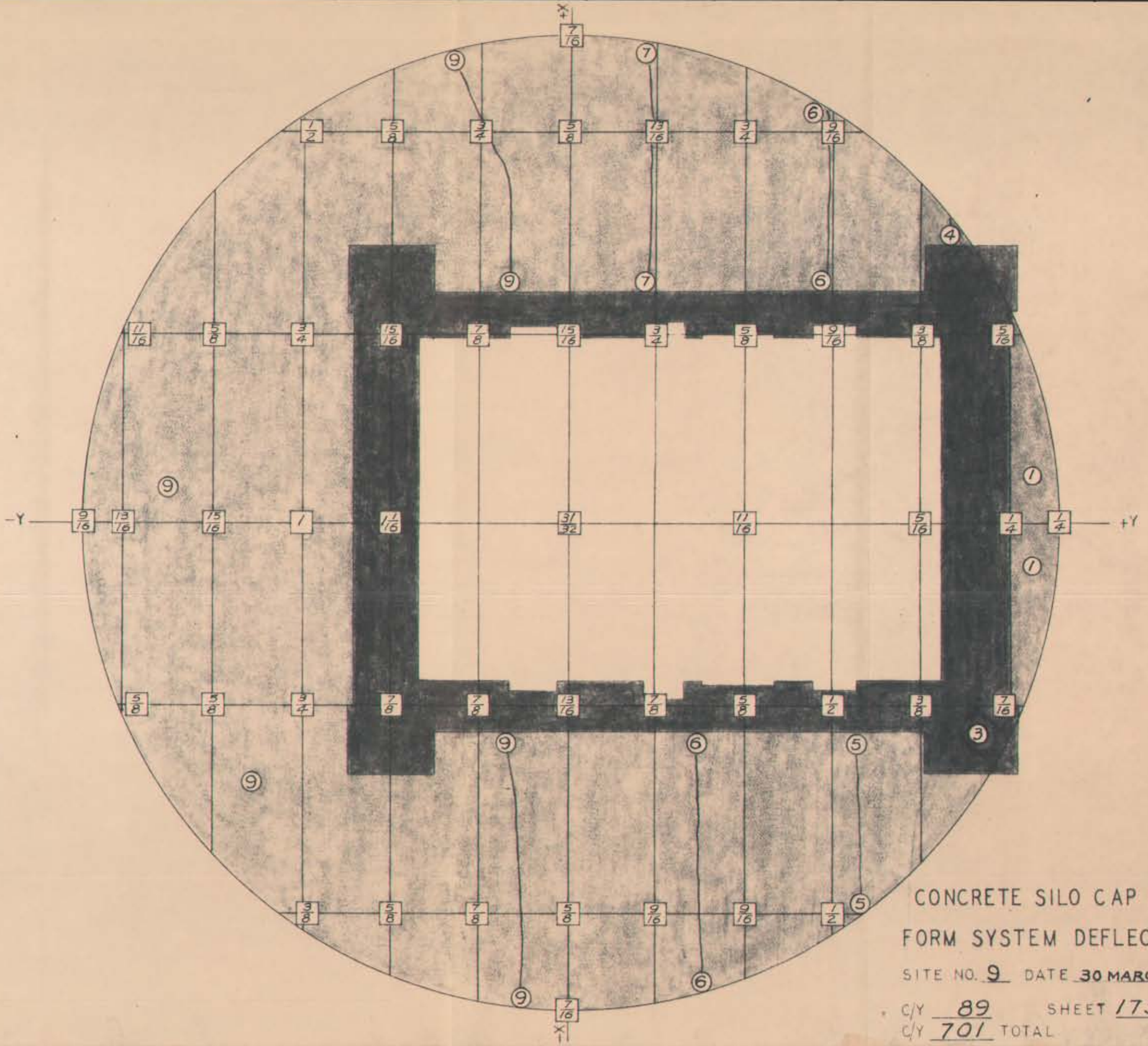
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 91 SHEET 1630 HRS

C/Y 612 TOTAL



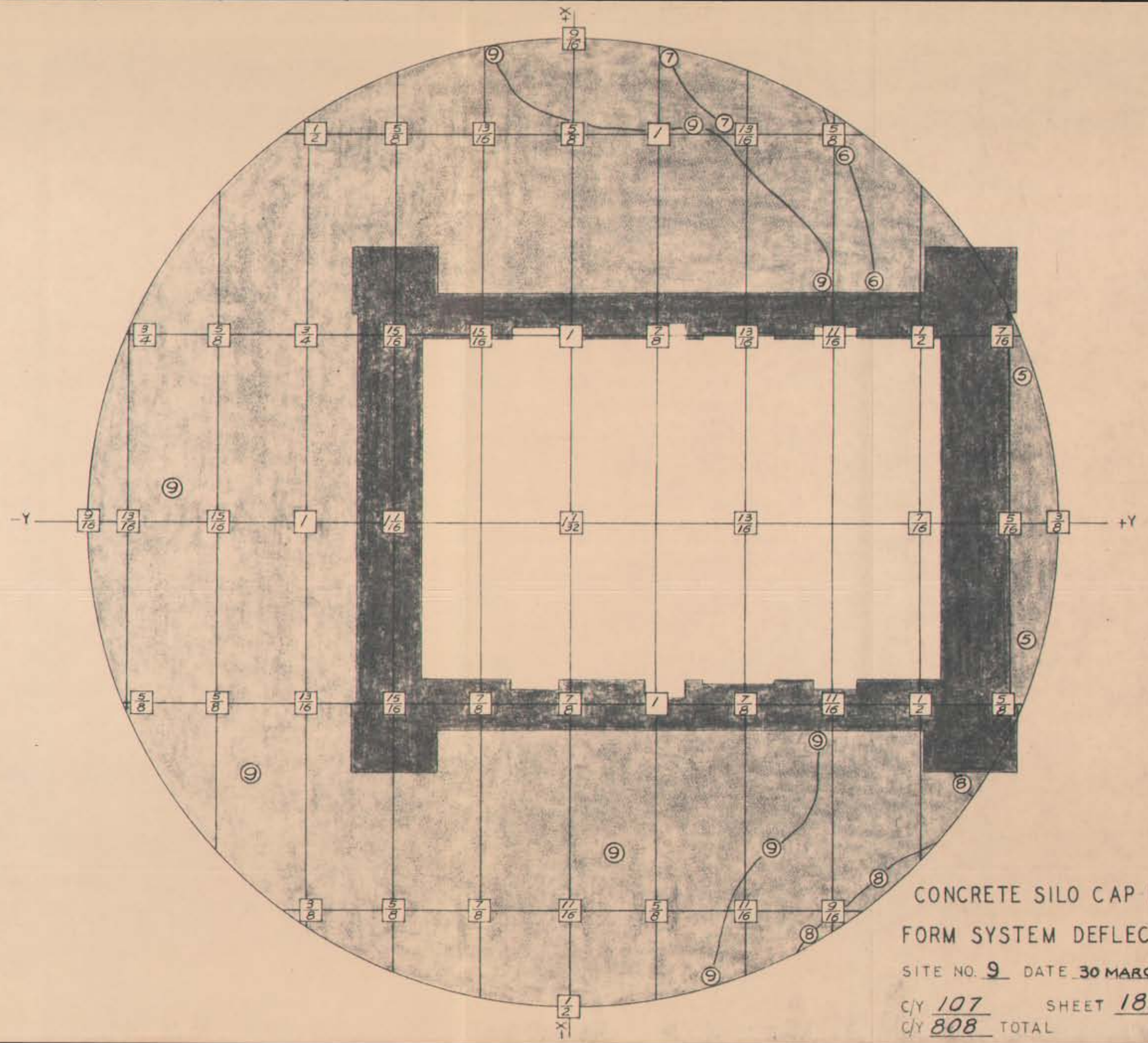
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 89 SHEET 1730 HRS

C/Y 701 TOTAL



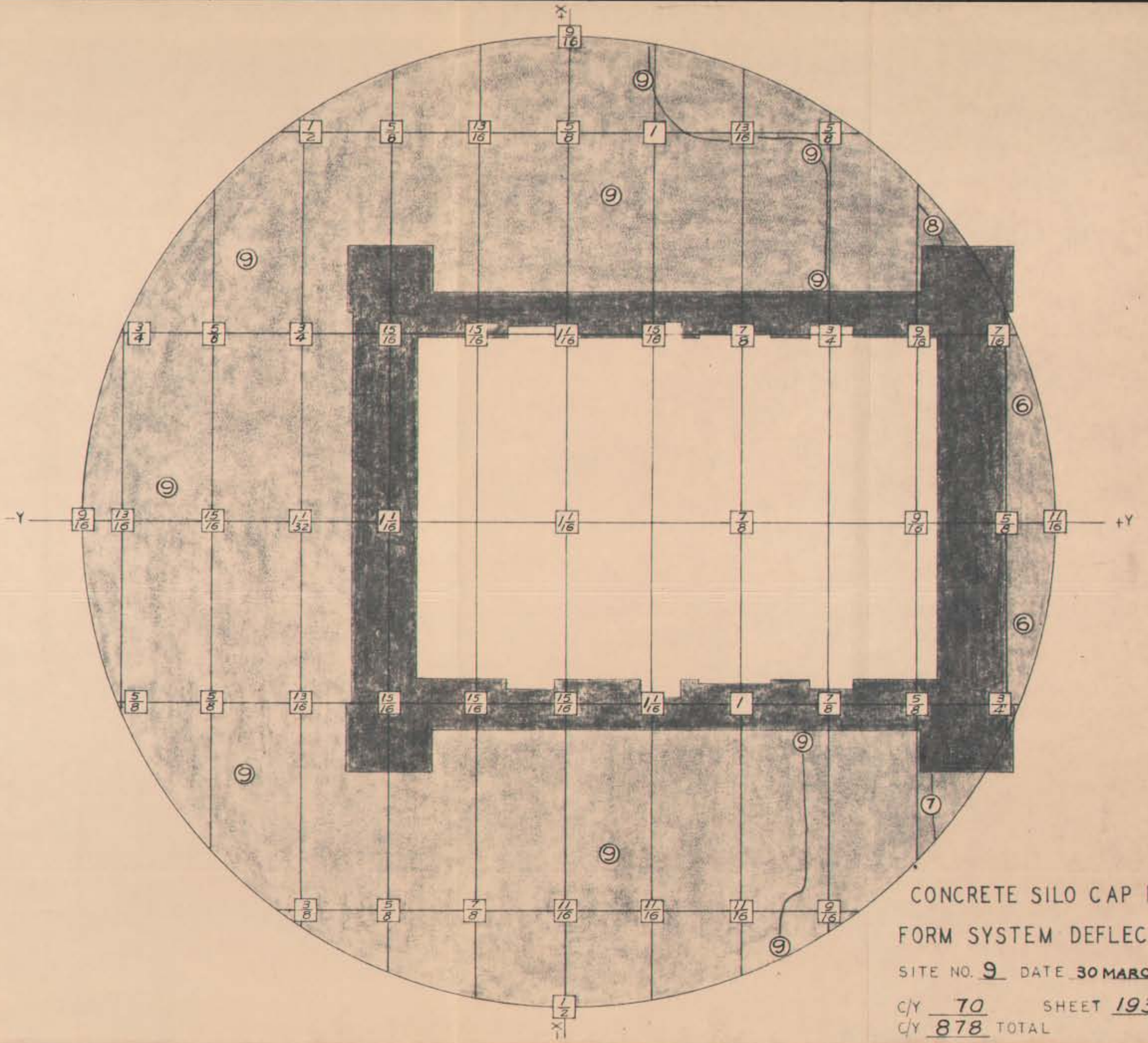
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 107 SHEET 1830 HRS

C/Y 808 TOTAL



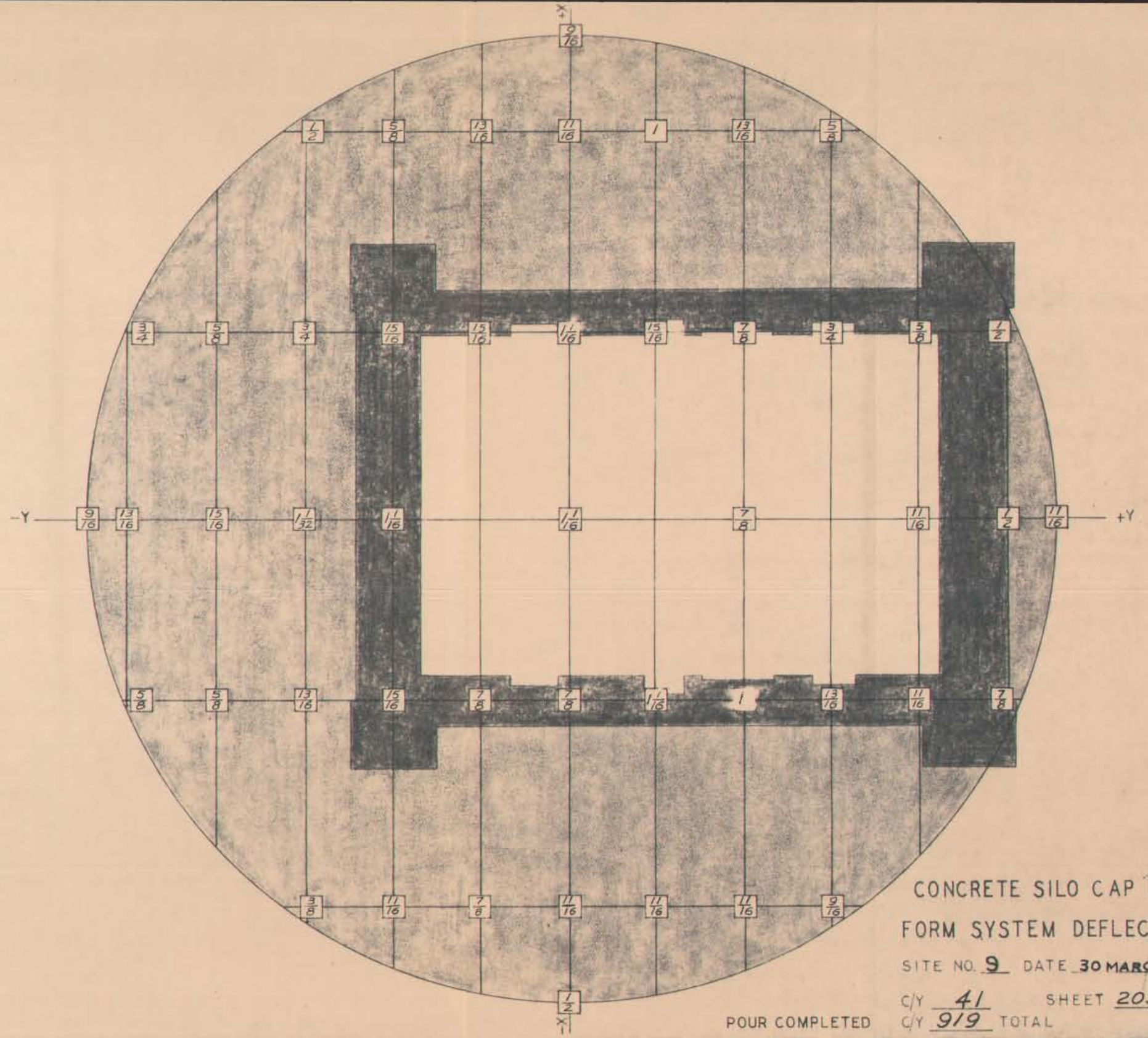
CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 70 SHEET 1930 HRS

C/Y 878 TOTAL



CONCRETE SILO CAP POUR

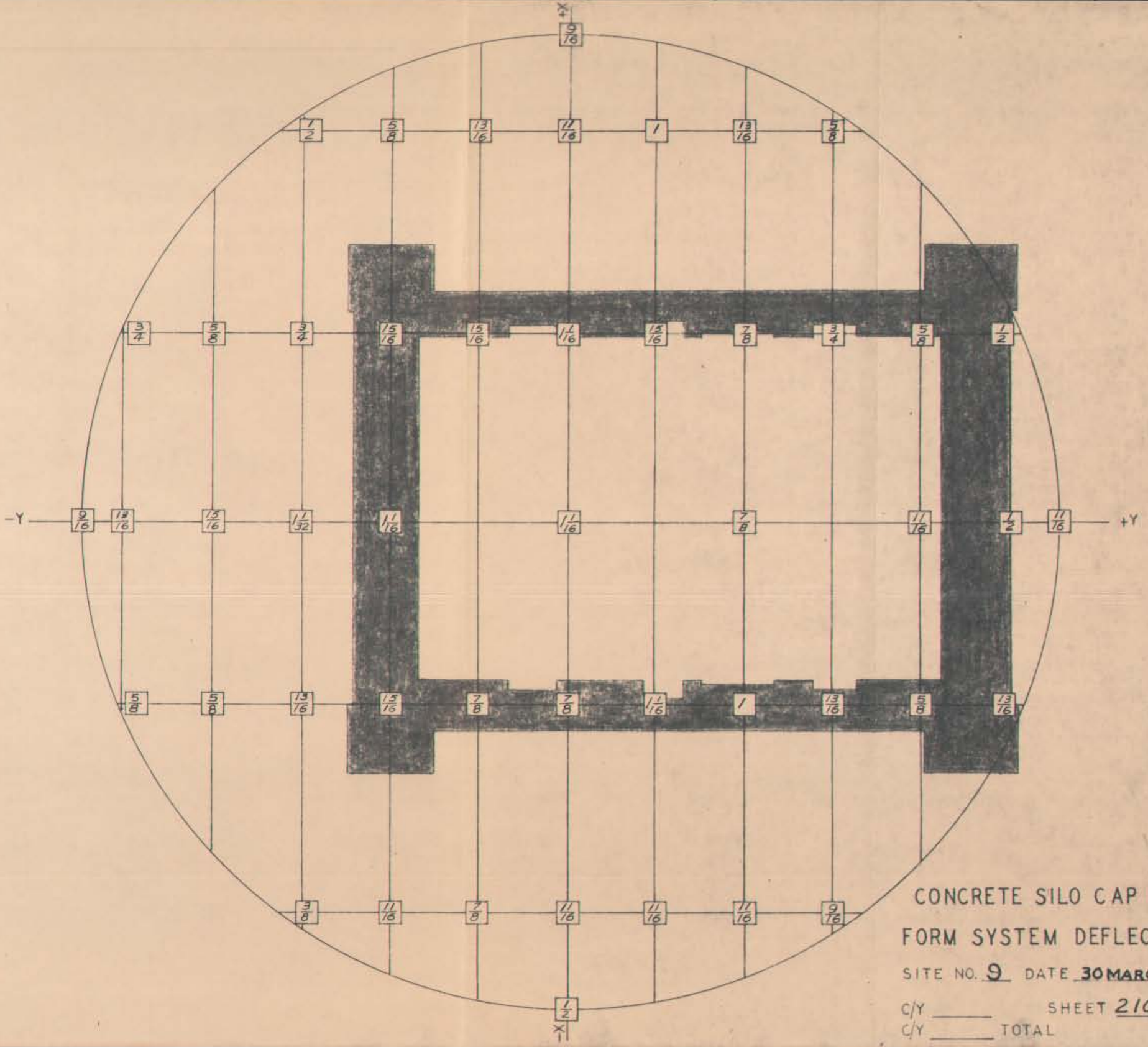
FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y 41 SHEET 2030 HRS

C/Y 919 TOTAL

POUR COMPLETED



CONCRETE SILO CAP POUR

FORM SYSTEM DEFLECTIONS

SITE NO. 9 DATE 30 MARCH 1961

C/Y _____ SHEET 2100 HRS

C/Y _____ TOTAL