405693

ENIWETOK ATOLL

1 ½ 0 1 2 3 4 5 6 7 8 9 10
NAUTICAL MILES

OCEAN

ELUGELAB
TEITEIRIPUCCHI
BOGAIRIKK
BOGOD
SAN ILDEFONSO
COCHITI
ZUNI
BOGOMBOGO
BOCALLUA
NOAH
IRENE
HELEN
GENE
FLORA
EDNA
DAISY
CLARA
BELLE
ALICE
ENGEBI
MUZINBAARIKKU
KIRINIAN
BOKONAARAPPU
YEIRI
AITSU
RUJORU
EBERIRU
AOMON
BIIJIRI
ROJOA
AARAANBIRU
PIIRAAI
PERCY
LUCY
KATE
JANET
NANCY
MARY
PEARL
OLIVE
WILMA
VERA
URSULA
OSCAR
ILDA
SALLY
RUBY
RUNIT
SAM
TOM
URIA
VAN
ZONA
YVONNE
CHINIEER
ANIYAAN
ALVIN
BRUCE
CLYDE
CHINIMI
JIERORU
REX
JAPTAN
DAVID
DEEP ENTRAN
ELMER
PARRY
FRED
WALT
SAND
ENIWETOK
RIGILI
LEROY
KEITH
JAMES
IRWIN
HENRY
GLENN
GIRINIEN
RIBAION
POKON
MUI
IGURIN

VARIATION - 6° 15' E. (1948)

CORAL HEAD (MACK)

L A G O O N

WIDE PASSAGE

REPOSITORY NATIONAL ARCHIVES PACIFIC SOUTHWEST REGION
COLLECTION RG 326 ATOMIC ENERGY COMMISSION
BOX No. 199679 (#1089) A16429 326-65A-170
4-8 LAST FOLDER FOR BOX 65A170
FOLDER A16429 - FIRST TAB ENIWETOK ATOLL - LAST TAB FORMS

DECLASSIFIED PER DOE
LETTER DATED JULY, 15, 1994
FROM ANTON SINISCALLI TO
DIANE S. NIXON

Misc. 310

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MARINE LANDING AND BEACHING INFORMATION FOR ALL SITES ENIWETOK ATOLL

ALICE — LCMs and LCUs beach on sand bar through break in reef. Require plus 1.5 tide or under. Tracked equipment and vehicles only.

Channel Markings: None at present.

CLARA — LCMs beach on sand bar through break in reef. Require plus 1.5 tide or under. Tracked equipment and vehicles only.

Channel Markings: None at present.

GENE
HELEN
IRENE — Causeway out between HELEN and GENE. Landings for LCUs and LCMs on west side of GENE. LCMs can beach at IRENE but require a plus 2.5 tide. IRENE and HELEN connected by causeway. Old channel at GENE useable but not recommended.

Channel Markings: None.

JANET — LCMs and LCUs at any tide.

Facilities: Hard sand ramp. (Note: Freight pier in damaged condition, not recommended for use until repairs made.)

Channel Markings: None.

KATE — LCMs requirea plus 1.5 tide and LCUs require a plus 3.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

LUCY — LCMs require a plus 1.5 tide and LCUs require a plus 3.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None

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MARINE LANDING AND BEACHING INFORMATION FOR ALL SITES (Cont'd)

MARY

LCMs can enter at any tide. LCUs require a plus 2.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

NANCY
OLIVE
PEARL

LCU (Only) require a plus 2.0 tide.

Facilities: Sandy and coral beach landing.

Channel Markings: None.

RUBY
SALLY
TILDA
URSULA

Connected by causeway. Entrance channel at URSULA. LCMs and LCUs can enter at any tide.

Facilities: Freight pier and concrete ramp.

Channel Markings: One lighted entrance buoy (Fl.-W.) and eleven channel buoys. (Oil drums; 6 red and 5 black.)

Note: The channel to the causeway landing between TILDA and URSULA and the channel to the damaged pier at SALLY have sanded in and are not being used. (Some old channel marking buoys are still in place.)

WILMA

LCMs can enter at any tide. LCUs require a plus 2.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

YVONNE

LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier and [illegible] concrete ramp.

Channel Markings: One lighted entrance buoy (Fl. W.).

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MARINE LANDING AND BEACHING INFORMATION FOR ALL SITES (Cont'd)

ZONA — DUKWs only.

ALVIN
BRUCE
CLYDE

LCMs can enter at any tide. LCUs require a plus 2.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

DAVID

LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier and a sandy beach landing.

Channel Markings: None.

ELMER

LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier, personnel pier and two concrete ramps.

Channel Markings: None.

FRED

LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier, personnel pier, 40 feet concrete ramp by personnel pier and sand ramp by freight pier.

Channel Markings: One clearance buoy just off the personnel pier.

GLORY
HENRY
IRVIN
JAMES
KENT

LCMs (Only) require a plus 2.0 tide.

Facilities: Pure coral beach landing. (Sandy in spots.)

Channel Markings: None. (Note: Not used very much.)

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MARINE BEACHING AND LANDING INFORMATION FOR ALL SITES (Cont'd)

LIMOY

LCMs require a plus 2.0 tide and LCUs require a plus 4.0 tide.

Facilities: Sandy beach landing

Channel Markings: One large nun buoy (Red #2) and four other channel buoys (oil drums) (3 red and 1 black).

Note: Red nun buoy #2 serves also as a mooring buoy for LCMs. Keep all red buoy close to starboard when entering channel. Beaching area is between the last red buoy (#8) and only black buoy (#7).

OSCAR

LCMs (Only) at any tide.

Facilities: A ladder is at the southeast side of tower.

Channel Markings: None.

MACK

LCMs and LCUs at any tide.

Facilities: Landing platform is at the north side of tower base.

Channel Markings: None.

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Survey Department

Bench Marks - Site Elmer

Bench Mark	Elev.	F.B.	Pg	Date	Remarks
Firehouse	17.590	229	12	10/27/54	
(Cross Cut In Conc. Door Pad)					
B.M. #1, Parry	24.951	229	12	10/27/54	Setting
(On Conc Slab in compound around Bldg. #311)					
P.I. "H"	13.208	229	9	10/21/54	Disc
(In Center of Heavy Equip. Storage yard)					
P.I. "Elm"	12.229	229	9	10/21/54	Disc
(In front of Bldg #162 Opp. P.O.L. Area)					
P.I. "B"	11.578	229	9	10/21/54	Disc
(Nr. Southwest Corner P.O.L. Fence.					
P.I. "C"	11.426	229	9	10/21/54	Disc
(In roadway at center of West P.O.L. Area Fence)					
P.I. "D"	11.593	229	9	10/21/54	Disc
(Nr. Northwest Corner of P.O.L. Area Fence)					
Tria Sta "Parry"	8.656	229	9	10/21/54	Disc
(Opposite Bldg. #229 in Marine Equip Storage yard)					
Mon. "Morry"	14.224	229	18	12/3/54	Disc
(Near Sawmill Next to Road)					
Mon. "Magnetic"	13.323	229	19	12/3/54	Disc
(North Airstrip Shoulder)					
R.M. 50'	13.246	229	19	12/3/54	Disc
(Off Edge of Airstrip Shoulder)					
R.M. 100'	13.691	229	19	12/3/54	Disc
(100 ' From Magnetic, in line with R.M. 50')					
Mon. "Manley"	12.994	229	20	12/3/54	Disc
(South and East of Bldg. #130)					
Mon. "Baldwin"	11.006	229	21	12/3/54	Disc
(South and East of Bldg #120 - Near Fence)					
R.P. for P.I. #23	12.872	229	14	11/26/54	L & T In Conc
(Near North East Corner CMR Area Fence-Lagoon Side)					
P.I. "L"	11.064	229	14	11/26/54	Disc
(Due North of Bldg #347 - CMR Salt Water Pumps)					
P.I. #25	10.848	229	15	11/26/54	Disc
(North of Sta 1131 Nr Assembly Area Gates)					
P.I. #26	9.782	229	15	11/26/54	Disc
(South End of Island Near Generator Shed and Water Tower)					
P.I. "M"	17.973	229	15	11/26/54	Disc
(Top of hill opposite Power House near Bldg 218)					

All Bench Marks indicated as discs are standard 2 5/8" Brass markers imbedded in a concrete monument approximately 6" below Existing ground grades

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HOLMES & NARVER, Inc

Survey Department

Bench Marks - Site Fred

Bench Mark	Elev	F.B.	Pg.	Date	Remarks
Top Tide Staff	9.72	229	23	11/22/54	
Tria. Sta. Eniwetok	11.02	229	23	11/22/54	Disc In Conc Mon
U.S.C. & G.S. B.M. #1	9.515	229	23	11/22/54	Disc In Conc Mon
U.S.C. & G.S. B.M. #2	11.21	229	23	11/22/54	Disc In Conc Mon
P.I. "Patsy"	10.39	229	23	11/22/54	Disc In Conc Mon
U.S.C. & G.S. B.M. #3	10.875	229	23	11/22/54	Disc in Conc Mon
P.O.L. #7	10.075	236	4	10/13/54	Al Bolt in Road
P.O.L. #17	9.95	236	4	10/13/54	Al Bolt in Road
P.O.L. #16	9.71	236	4	10/13/54	Al Bolt in Road
P.I. "Agnes"	9.39	236	4	10/13/54	Al Bolt in Road
P.O.L. #506	10.09	236	5	10/13/54	Al Bolt in Road
B.M. #6	10.28	236	5	10/13/54	Disc in Conc Mon
P.O.L. #113	10.03	236	5	10/13/54	Al Bolt in Road
P.I. "Mabel"	10.67	236	5	10/13/54	Al Bolt in Road
P.O.L. #54	10.17	236	5	10/13/54	Al.Bolt in Road
P.I. "Tulip"	11.67	236	6	10/13/54	Disc in Conc Mon
P.I. #15	12.09	236	6	10/13/54	Disc in Conc Mon
Disc in Conc Nr Old P.I. #16	9.50	236	6	10/13/54	Disc in Conc Mon
P.I. #17	11.14	236	7	10/13/54	Disc in Conc Mon
P.I. #18	12.29	236	7	10/13/54	Disc in Conc Mon
P.I. #19	14.075	236	7	10/13/54	Disc in Conc Mon
P.I. #20	9.58	236	7	10/13/54	Disc in Conc Mon
P.I. "Linda"	10.63	236	10	10/23/54	Al Bolt in Road
Eniwet "B"	10.825	236	10	10/23/54	Disc in Conc Mon

Bench Mark	Elev	F.B.	Pg.	Date	Remarks
P.I. "Becky"	11.49	236	10	10/23/54	Al Bolt in Road
P.I. "B"	9.68	236	10	10/23/54	Disc in Conc Mon
Eniwet "C"	13.87	236	11	10/23/54	Disc in Conc Mon
P.I. "Sue"	13.31	236	11	10/23/54	Al Bolt in Road
P.O.L. #73	13.88	236	11	10/23/54	Al Bolt in Road
P.I. "E"	14.78	236	11	10/23/54	Disc in Conc Mon
P.I. "Delia"	14.675	236	11	10/23/54	Al Bolt in Road
P.I. #12	11.79	236	11	10/23/54	Disc in Conc Mon
P.O.L. "Taxi"	9.445	236	12	10/23/54	Al Bolt in Taxiway
P.O.L. "Bay"	11.26	236	12	10/23/54	Disc in Conc Mon
P.I. "Port"	12.37	236	13	10/23/54	Disc in Conc Mon
Eniwet "A"	15.06	236	13	10/23/54	Disc in Conc Mon
P.O.L. #67	16.83	236	20	11/20/54	Al Bolt in Road
P.I. "F"	15.94	236	20	11/20/54	Disc in Conc Mon
P.I. "Judy"	18.31	236	20	11/20/54	Al Bolt in Road
H&N Disc Conc Mon	14.77	236	20	11/20/54	
P.I. "Lana "	14.21	236	21	11/20/54	Al Bolt in Road
P.I. "Karen"	13.125	236	21	11/20/54	Al Bolt in Road
P.I. #6	9.61	236	21	11/20/54	Disc in Conc Mon
P.I. "Lily"	13.36	236	22	11/20/54	
P.I. #8	10.55	236	22	11/20/54	Conc Mon
Mon "Air"	10.997 (11.00)	236	22	11/20/54	Conc Mon
P.O.L. "Wing"	9.40	236	23	11/20/54	Conc Mon
P.O.L. "Strut"	8.53	236	23	11/20/54	Conc Mon
P.O.L. "Flap"	7.50	236	24	11/20/54	Conc Mon
P.O.L. "Bomb"	7.37	236	25	11/20/54	Conc Mon

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION		REMARKS
ALICE	BOGA #2	8.675	20	21	1-10-50	H&N DISC, CONC. MON.	F.S. 516	CLOSED CIRCUIT FROM STA. BOGA (STA. BOGA, TIDE OBSERVATIONS)
BELLE	P.I. "A"	8.06	148	22	10-12-51	COPPER PIPE, LEAD & TACK, CONC. MON.	F.S. 522	RUN FROM BOGA #2
	P.I. "E"	8.16	151	25	11-14-51	H&N DISC, CONC. MON.	F.S. 537	CLOSED CIRCUIT FROM P.I. "A"
CLARA	P.I. "R"	6.57	157	2	2-15-52	H&N DISC. CONC. MON.	F.S. 550	CLOSED CIRCUIT FROM P.I. "E"
	RUCHI	9.72	157	16	2-20-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 550	CLOSED CIRCUIT FROM P.I. "R"
DAISY	PYNE	7.80	157	16	2-20-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 554	CLOSED CIRCUIT FROM P.I. "R"
	CHITI	8.39	157	16	2-20-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 554	CLOSED CIRCUIT FROM P.I. "R"
EDNA	SAM	6.87	158	5	2-26-52	ALUM. PIPE & CAP, CONC. MON	F.S. 555	CLOSED CIRCUIT FROM CHITI
		(8.86	158	5	2-26-52	ALUM. PIPE & CAP,	F.S. 555	CLOSED CIRCUIT FROM CHITI
	FONSO	(8.53	158	7	2-27-52	CONC. MON.	F.S. 555	CLOSED CIRCUIT FROM ELUG
FLORA	R.P. "X"	8.965	164	17	5-8-52	ALUM. PIPE & CAP, CONC. MON.		CLOSED CIRCUIT FROM ELUG
	ELUG	8.115	152	5	11-20-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	ELAB	10.09	152	5	11-20-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
GENE	PUCCHI	9.215	152	20	12-3-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	INTER "X"	8.07	152	20	12-3-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	TENT POLE T	6.81	155	12	2-1-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	TEITEIR	8.545	158	20	3-1-52	H&N DISC, CONC. MON.	F.S. 543	TIDE OBSERVATIONS
HELEN	BOGAIR	6.51	152	20	12-3-51	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	RIKK	5.29	152	20	12-3-51	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
IRENE	JIM	6.59	156	26	2-14-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CIRCUIT NOGOB TO BOGON
	NOGOB	5.75	152	20	12-3-51	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	BOGON	7.15	152	20	12-3-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	MART	10.99	156	26	2-14-52	ALUM. PIPE & CAP,	F.S. 543	CIRCUIT NOGOB TO BOGON
JANET	ENGEBI	10.08	10	18	5-14-59	U.S.C.&G.S., CONC. MON.	F.S. 73	TIDE OBSERVATIONS
	LADEDA	9.76	43	14	6-2-50	H&N DISC, CONC. MON.	F.S. 73	CLOSED CIRCUIT FROM ENGEBI
	T.A.K.	9.39	69	23	9-13-50	NAIL IN CONC. MON.	F.S. 73	CLOSED CIRCUIT FROM ENGEBI
	R.P. 4	9.09	168	7	4-28-52	20MM SHELL IN CONC. MON.	F.S. 73	CLOSED CIRCUIT FROM ENGEBI
	R.P. 3	9.86	168	27	5-3-52	H&N DISC, CONC. MON.	F.S. 73	CIRCUIT, TANKS TO R.P. 4

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
FRED	B.M. 53-J	11.78	LIST OF VALID BENCHES			S.W. COR SLAB BLDG. #84	
	B.M. 53-K	15.67	LIST OF VALID BENCHES			S.E. COR. OF W. STEP BLDG. #90	
	P.I. #6	8.55	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #8	10.49	208	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #10	15.33	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #12	11.81	204	17	6-1-53	STANDARD H&N DISC IN CONC.	
	P.I. #15	12.01	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #17	12.16	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #20	9.59	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. "B"	9.66	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. "E"	14.76	203	19	4-21-53	USN DISC IN TRUNCATED CONC PYRAMID	
	P.I. "F"	15.92	203	19	4-21-53	CONC. MON.	
	ENIWETOK	11.05	LIST OF VALID BENCHES			NAVY MON. NR. BLDG. #1	
	USC & GS #3	10.90	LIST OF VALID BANCHES			USC & GS DISC IN CONC. MON.	
	PANSY	10.40	LIST OF VALID BENCHES			STANDARD H&N DISC IN CONC.	
	VIOLET	12.25	LIST OF VALID BENCHES			STANDARD H&N DISC IN CONC.	
	ROSE	11.61	LIST OF VALID BENCHES			STANDARD H&N DISC IN CONC.	

NOTE: STANDARD H&N DISC IN CONCRETE IS A 2 5/8" DIA BRASS DISC SET IN A CONCRETE MONUMENT FROM 6 TO 8 INCHES BELOW GROUND ELEVATION, WITH NAME OR NUMBER DESIGNATION STAMPED ON ITS FACE.

REFERENCE TO "LIST OF VALID BENCHES" REFERS TO LIST ASSEMBLED, ADJUSTED AND REPRODUCED FROM VARIOUS LEVEL CIRCUITS ON SITE FRED.

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
KATE	MUZIN	6.40	28	27	3-30-50	CONC. MON.	TIDE OBSERVATIONS
	P.I. "A"	8.72	141	28	6-31-51	STANDARD H&N DISC. IN CONC.	CLOSED CIRCUIT FROM MUZIN
LUCY	BEACON "M"	8.60	37	7	4-12-50	USN CONC. MON	TIDE OBSERVATIONS
	R.P. "A"	6.71	142	5	6-15-51	STANDARD H&N DISC IN CONC.	CLOSED CIRCUIT FROM BN "M"
	R.P. "B"	7.09	142	5	6-15-51	STANDARD H&N DISC IN CONC.	CLOSED CIRCUIT FROM BN. "M"
MARY	BOKON	10.40	31	6	3-27-50	CONC. MON.	TIDE OBSERVATIONS
	MATT	9.53	159	10	4-3-52	CONC. MON.	CLOSED CIRCUIT FROM BOKON
	ROOK	10.04	215	18	12-22-53	CONC. MON.	CLOSED CIRCUIT FROM BOKON
NANCY	NICK	10.54	159	10	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	YEIRI	9.96	159	10	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	JON	10.955	207	25	11-14-53	ALUM. BOLT IN CONC. MON.	CIRCUIT FROM YIERI
OLIVE	OMAR	11.57	159	21	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	AITSU	10.05	159	21	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	EATON	13.51	207	22	11-13-53	CONC. MON.	CLOSED CIRCUIT FROM AITSU
	EVY	9.29	207	22	11-13-53	Bolt in Conc Mon.	CLOSED CIRCUIT FROM AITSU
PEARL	PAUL	9.73	159	8	4-7-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	RUJURO	10.90	159	9	3-21-52	CONC. MON.	CLOSED CIRCUIT FROM BOKON
	TENT POLE "J"	9.33	207	24	11-14-53	CONC. MON.	CLOSED CIRCUIT FROM RUJURO
	TENT POLE "K"	13.88	207	24	11-14-53	CONC. MON.	CLOSED CIRCUIT FROM RUJURO
	TENT POLE "L"	11.62	207	24	11-14-53	CONC. MON.	CLOSED CIRCUIT FROM RUJURO
RUBY	RUBY	8.837	212	26	11-7-53	STANDARD H&N DISC IN CONC.	
SALLY	AOMON	8.41	202	11	5-12-53	U.S.C. & G.S. BRASS DISC IN CONC.	DISTURBED ABOUT 5-1-53
	DUKE	6.10	202	12	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	DAN	12.40	202	12	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
TILDA	JACK	7.18	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	JEAN	8.78	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	IOWA	7.95	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
URSULA	KATE	8.66	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	R.P. KATE	8.33	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	UTAH	8.34	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	LUKE	10.94	207	20	11-11-53	6" CENTER PUNCHED BOLT IN CONC.	CLOSED CIRCUIT FROM KATE
VERA *	LUCY	8.44	33	2	12-( )-50	STANDARD H&N DISC. IN CONC.	TIDE OBSERVATIONS
	BEACON "K"	12.22	33	2	12-( )-50	USN DISC IN CONC.	CLOSED CIRCUIT FROM LUCY
WILMA	PIIRAAI	8.80	24	22	1-20-50	CONC. MON.	TIDE OBSERVATIONS
	STA. 60	9.88	124	18	3-9-51	✓ CHISELED IN SE FTG OF NE TOWER	CLOSED CIRCUIT FROM PIRAAI
	STA. 62	9.55	124	18	3-19-51	✓ CHISELED IN SE FTG SW	CLOSED CIRCUIT FROM PIRAAI
YVONNE	#59	4.26	104	16	5-23-51	NOT AVAILABLE	C.C. FROM TRAVERSE RUNIT
	USC&GS NO BASE	6.60	104	16	5-23-51	U.S.C. & G.S. CONC. MON.	CC. FROM TRAVERSE RUNIT
	#26 (L&T)	23.40	104	16	5-23-51	NOT AVAILABLE	C.C. FROM TRAVERSE RUNIT
VERA *	BABE	13.32	217	7	12-22-53	CLOSED CIRCUIT FROM LUCY (STA)	CONCRETE MONUMENT SET 1953

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
YVONNE	TRAVERSE RUNIT	12.95	5	2	3-16-49	U.S.C. & G.S. MON.	TIDE OBSERVATIONS
	SOUTH BASE	8.33	134	15	6-16-51	U.S.C. & G.S. MON.	C.C. FROM TRAVERSE RUNIT ALSO CALLED RUNIT
ZONA	TOWER FTGS	6.67	73	20	11-29-50	NOT AVAILABLE	C.C. FROM RUNIT
	WINCH BASE	6.64	73	20	11-29-50	NOT AVAILABLE	C.C. FROM RUNIT
ALVIN							
BRUCE	ANIYAANII	9.60	165	14	4-17-52		TIDE OBSERVATIONS
	BESS	8.70	165	18	4-19-52		C.C FROM ANIYAANII
	BYRL	9.07			4-19-52		C.C. FROM ANIYAANII
CLYDE							
DAVID	PIER	9.00	85	12	12-9-50	PILE CUTOFF - BASE OF PIER	FROM M.H. INVERT GRADES
	BLDG. 48	10.17	32	3	3-14-50	BOOSTER PUMP STATION	NO SOURCE GIVEN
ELMER	ASH	9.86	F.S. 578			STANDARD H&N DISC IN CONC.	
	PARRY	8.63	F.S.578			STANDARD H&N DISC IN CONC.	
	MAGNETIC	[illegible]	F.S.578			STANDARD H&N DISC IN CONC.	
	"H"	13.24	F.S. 578			STANDARD H&N DISC IN CONC.	
	"L"	11.07	F.S.578			STANDARD H&N DISC IN CONC.	
	"M"	17.97	F.S.578			STANDARD H&N DISC IN CONC.	
	P.I. #25	10.84	F.S.578			STANDARD H&N DISC IN CONC.	
	P.I. #26	9.77	F.S.578			STANDARD H&N DISC IN CONC.	
FRED	ENIWET "A"	15.03	LIST OF	VALID	BENCHES	USC & GS MON. 220' N OF NE COR.	AIRSTRIP
	ENIWET "B"	10.83	LIST OF	VALID	BENCHES	USC & GS MON. NO. BLDG. 117A & B	
	ENIWET "C"	13.85	LIST OF	VALID	BENCHES	USC & GS MON. ACCR. RD FR BLDG 61	
	B.M. #4	12.02	LIST OF	VALID	BENCHES	CONC. MON. 93' SW USC & GS #2	
	B.M. #6	10.27	LIST OF	VALID	BENCHES	CONC. MON. NO. SIDE CHAPEL	
	B.M. #7	11.65	LIST OF	VALID	BENCHES	CONC. PYRAMID ACROSS FR WOODS FIELD	STAMPED H&N TULIP
	B.M. 53-A	10.87	LIST OF	VALID	BENCHES	N.W. COR. SLAB BLDG. #7	
	B.M. 53-B	11.17	LIST OF	VALID	BENCHES	N.E. COR. DOOR SLAB BLDG. #15	
	B.M. 53-C	12.33	LIST OF	VALID	BENCHES	N.E. COR. SLAB BLDG. #50	
	B.M. 53-D	13.82	LIST OF	VALID	BENCHES	TOP FIRE HYD. OPP. WHSE #37	
	B.M. 53-F	11.32	LIST OF	VALID	BENCHES	S.W. COR. CENTER SLAB BLDG. #56	
	B.M. 53-H	19.84	LIST OF	VALID	BENCHES	TOP FIRE HYD. #16 OPP. BLDG #160	
	B.M. 53-I	17.21	LIST OF	VALID	BENCHES	TOP FIRE HYD. #17 83' N. OPP. BLDG. #156	
LEROY	RIGILI	9.11	159	4	2-21-52	50 Cal shell in Conc Mon	Tide Observations

ENGINEERING CALCULATION SHEET

HOLMES & NARVER, INC.
ENGINEERS - CONSTRUCTORS

JOB NO. 942
SHEET 1 OF
BY ES DATE

TITLE HEIGHT OF TIDE AT ANY TIME

Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between their heights is the range of tide. Find the difference between the time of the nearest high or low and the time for which the height is required. (Cont'd at bottom of page)

DURATION OF RISE OR FALL h m	TIME FROM NEAREST HIGH OR LOW WATER													
4 00	0 05	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00
4 20	0 09	0 17	0 26	0 35	0 43	0 52	1 0.	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10
4 30	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30

RANGE OF TIDE FT	CORRECTION TO HEIGHT													
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
2.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5

Enter the table with the duration of rise or fall, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual diff. The correction sought is in the

TIDE TABLES

ENIWETOK ATOLL, MARSHALL ISLANDS

1957

This tabulation is extracted from "Tide Tables, Central and Western Pacific Ocean and Indian Ocean, 1957", and published by the U.S. Department of Commerce, Coast and Geodetic Survey.

Datum, elevation 0.0, is defined in the above publication as follows: "Heights are reckoned from the datum of soundings on the largest scale charts of the locality which is ½ foot below mean low water springs" for Kwajalein Atoll, Marshall Islands.

The reference station is Kwajalein Atoll, time meridian 180 degrees east. The following tabulation appears in Table 2. - Tidal Differences and ranges:

	Lat	Long.	Time	Ranges	
				Mean	Spring
Eniwetok Atoll	11° 21'	162° 21'	-05 min.	2.7'	3.9'

Range is the difference between successive tides, i.e., between a high and a low or a low and a high. Mean range is the average range of all tides in the year. Spring range is the average of the largest ranges in the year. Springs occur once each lunar month (approximately 28 days) when the highest highs and the lowest lows are recorded.

The values in this tabulation are based on average weather conditions. Unusual weather, particularly high winds from a direction other than seasonally normal, affect both the times and the heights.

Each site in the Atoll has a slightly different time and height of highs and lows. This can be disregarded for all practical purposes in the lagoon. The water level on the ocean reef is always higher than that of the lagoon, the difference varying from a few tenths to 1.5'.

COMPILED BY:
HOLMES & NARVER, INC.,
ENGINEERS-CONSTRUCTORS
SURVEY DEPARTMENT
ENGINEERING DIVISION
SITE ELMER

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR JANUARY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0416	H 3.7	9	0236	L 1.5	17	0450	H 4.2	25	0519	L 1.9
Tu	1007	L 0.9	W	0902	H 3.3	Th	1046	L 0.4	F	1230	H 3.3
	1628	H 4.6		1503	L 1.9		1705	H 5.1		1935	L 2.0
	2255	L 0.8		2103	H 3.2		2329	L 0.2		----	- ---
2	0448	H 3.8	10	0336	L 1.7	18	0528	H 4.3	26	0117	H 2.8
W	1039	L 0.8	Th	1023	H 3.2	F	1126	L 0.4	Sa	0704	L 1.9
	1658	H 4.6		1650	L 2.1		1744	H 5.0		1350	H 3.5
	2324	L 0.7		2235	H 2.9		----	- ---		2037	L 1.7
3	0519	H 3.8	11	0506	L 1.3	19	0006	L 0.3	27	0226	H 3.0
Th	1111	L 0.8	F	1202	H 3.4	Sa	0607	H 4.2	Su	0808	L 1.7
	1728	H 4.6		1846	L 1.9		1206	L 0.5		1439	H 3.8
	2353	L 0.7		---	- ---		1822	H 4.8		2115	L 1.4
4	0550	H 3.8	12	0030	H 2.9	20	0043	L 0.5	28	0306	H 3.2
F	1141	L 0.9	Sa	0637	L 1.7	Su	0646	H 4.2	M	0851	L 1.4
	1758	H 4.5		1320	H 3.7		1247	L 0.8		1515	H 4.2
	----	- ---		1959	L 1.5		1900	H 4.4		2145	L 1.1
5	0022	L 0.8	13	0149	H 3.2	21	0119	L 0.8	29	0339	H 3.5
Sa	0621	H 3.8	Su	0744	L 1.4	M	0727	H 3.9	Tu	0927	L 1.2
	1212	L 1.1		1416	H 4.1		1329	L 1.2		1546	H 4.4
	1827	H 4.3		2050	L 1.2		1939	H 4.0		2212	L 0.8
6	0051	L 0.9	14	0244	H 3.5	22	0158	L 1.2	30	0407	H 3.8
Su	0652	H 3.2	M	0837	L 1.1	Tu	0812	H 3.7	W	1001	L 1.0
	1244	L 1.2		1502	H 4.5		1418	L 1.5		1616	H 4.5
	1857	H 4.1		2133	L 0.8		2022	H 3.5		2239	L 0.7
7	0121	L 1.1	15	0329	H 3.8	23	0241	L 1.5	31	0436	H 3.9
M	0727	H 3.5	Tu	0923	L 0.8	W	0908	H 3.5	Th	1030	L 0.8
	1319	L 1.5		1544	H 4.8		1523	L 1.9		1644	H 4.6
	1929	H 3.8		2213	L 0.5		2217	H 3.1		2305	L 0.6
8	0155	L 1.3	16	0410	H 4.0	24	0339	L 1.8			
Tu	0807	H 3.4	W	1005	L 0.5	Th	1032	H 3.2			
	1402	L 1.7		1625	H 5.0		1726	L 2.2			
	2007	H 3.5		2251	L 0.2		2300	H 2.8			

DAY	SUNRISE	SUNSET
1	0731	1858
11	0734	1904
21	0735	1910
31	0736	1914

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR FEBRUARY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0504	H 4.1	9	0345	L 1.8	17	0548	H 4.6	25	0226	H 2.9
F	1059	L 0.8	Sa	1054	H 3.4	Su	1154	L 0.4	M	0800	L 1.9
	1732	H 4.6		1705	L 2.1		1804	H 4.8		1424	H 3.7
	2331	L 0.6		2350	H 3.8		----	-----		2100	L 1.5
2	0531	H 4.2	10	----	-----	18	0016	L 0.5	26	0257	H 3.3
Sa	1123	L 0.8	Su	0555	L 1.9	M	0623	H 4.5	Tu	0844	L 1.6
	1738	H 4.6		1249	H 3.6		1231	L 0.6		1459	H 4.0
	2356	L 0.6		1945	L 1.7		1858	H 4.4		2125	L 1.2
3	0558	H 4.2	11	0139	H 3.1	19	0048	L 0.8	27	0325	H 3.6
Su	1156	L 0.8	M	0729	L 1.6	Tu	0658	H 4.3	W	0917	L 1.3
	1805	H 4.5		1400	H 4.0		1308	L 1.0		1529	H 4.2
	----	-----		2039	L 1.2		1911	H 4.0		2150	L 1.0
4	0021	L 0.8	12	0237	H 3.5	20	0119	L 1.1	28	0350	H 3.9
M	0626	H 4.1	Tu	0829	L 1.2	W	0735	H 4.0	Th	0947	L 1.1
	1225	L 1.0		1451	H 4.5		1348	L 1.5		1557	H 4.5
	1831	H 4.2		2121	L 0.8		1944	H 3.5		2214	L 0.8
5	0047	L 0.9	13	0320	H 3.8	21	0151	L 1.5			
Tu	0654	H 4.0	W	0916	L 0.8	Th	0816	H 3.7			
	1256	L 1.2		1534	H 4.8		1439	L 1.8			
	1859	H 3.9		2159	L 0.5		2021	H 3.1			
6	0114	L 1.1	14	0359	H 4.2	22	0228	L 1.8			
W	0727	H 3.8	Th	0959	L 0.5	F	0917	H 3.3			
	1331	L 1.5		1614	H 5.0		1616	L 2.2			
	1931	H 3.6		2236	L 0.3		2133	H 2.6			
7	0146	L 1.3	15	0436	H 4.5	23	0343	L 2.2			
Th	0802	H 3.6	F	1038	L 0.3	Sa	1131	H 3.2			
	1419	L 1.8		1652	H 5.2		1929	L 2.2			
	2013	H 3.2		2310	L 0.2		----	-----			
8	0229	L 1.6	16	0512	H 4.6	24	0116	H 2.6			
F	0909	H 3.5	Sa	1116	L 0.3	Su	0643	L 2.2			
	1538	L 2.0		1723	H 5.0		1331	H 3.4			
	2124	H 2.9		2344	L 0.2		2029	L 1.8			

DAY	SUNRISE	SUNSET
5	0735	1915
15	0733	1918
25	0728	1920

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR MARCH 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0417	H 4.2	9	0151	L 1.6	17	0451	H 4.9	25	0046	H 2.7
F	1015	L 0.8	Sa	0829	H 3.7	Su	1102	L 0.3	M	0602	L 2.5
	1623	H 4.6		1507	L 2.0		1708	H 4.8		1244	H 3.3
	2238	L 0.6		2055	H 2.9		2317	L 0.4		1950	L 1.9
2	0441	H 4.3	10	0259	L 1.9	18	0525	H 4.9	26	0202	H 3.0
Sa	1042	L 0.8	Su	1005	H 3.5	M	1137	L 0.4	Tu	0738	L 2.2
	1649	H 4.6		1733	L 2.1		1742	H 4.6		1350	H 3.5
	2302	L 0.6		2330	H 2.8		2347	L 0.5		2025	L 1.6
3	0506	H 4.5	11	0526	L 2.1	19	0558	H 4.8	27	0233	H 3.4
Su	1109	L 0.7	M	1220	H 3.6	Tu	1213	L 0.7	W	0823	L 1.8
	1715	H 4.6		1923	L 1.8		1814	H 4.3		1429	H 3.8
	2326	L 0.6		----	-----		----	----		2051	L 1.4
4	0531	H 4.5	12	0127	H 3.2	20	0017	L 0.8	28	0258	H 3.8
M	1137	L 0.7	Tu	0717	L 1.8	W	0631	H 4.5	Th	0856	L 1.5
	1741	H 4.5		1341	H 3.9		1240	L 1.0		1500	H 4.1
	2350	L 0.7		2013	L 1.3		1845	H 3.9		2116	L 1.1
5	0557	H 4.5	13	0221	H 3.6	21	0045	L 1.2	29	0323	H 4.1
Tu	1205	L 0.8	W	0818	L 1.3	Th	0705	H 4.2	F	0925	L 1.2
	1807	H 4.2		1445	H 4.4		1325	L 1.4		1528	H 4.3
	----	-----		2059	L 0.9		1916	H 3.5		2140	L 0.9
6	0014	L 0.8	14	0303	H 4.1	22	0113	L 1.5	30	0348	H 4.3
W	0625	H 4.4	Th	0904	L 0.8	F	0740	H 3.8	Sa	0953	L 0.9
	1236	L 1.0		1518	H 4.7		1409	L 1.3		1555	H 4.5
	1835	H 4.0		2137	L 0.5		1951	H 3.1		2205	L 0.8
7	0041	L 1.0	15	0341	H 4.5	23	0143	L 1.9	31	0413	H 4.5
Th	0657	H 4.2	F	0946	L 0.5	Sa	0827	H 3.5	Su	1021	L 0.8
	1311	L 1.3		1557	H 4.9		1524	L 2.2		1623	H 4.5
	1907	H 3.7		2211	L 0.4		2047	H 2.7		2229	L 0.7
8	0111	L 1.3	16	0416	H 4.8	24	0236	L 2.2			
F	0735	H 4.0	Sa	1025	L 0.3	Su	1007	H 3.2			
	1356	L 1.6		1603	H 5.0		1830	L 2.2			
	1948	H 3.3		2245	L 0.3		----	-----			

DAY	SUNRISE	SUNSET
2	0726	1921
12	0720	1922
22	0714	1922

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR APRIL 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0439	H 4.7	9	0508	L 2.2	17	0535	H 4.9	25	0148	H 3.4
M	1049	L 0.7	Tu	1147	H 3.6	W	1156	L 0.8	Th	0746	L 2.0
	1650	H 4.5		1847	L 1.7		1753	H 4.2		1341	H 3.6
	2254	L 0.7		----	- ---		2350	L 0.9		2003	L 1.5
2	0505	H 4.8	10	0059	H 3.3	18	0608	H 4.7	26	0220	H 3.8
Tu	1118	L 0.7	W	0657	L 1.8	Th	1231	L 1.1	F	0824	L 1.7
	1718	H 4.4		1313	H 3.8		1825	H 3.8		1420	H 3.8
	2321	L 0.8		1947	L 1.4		----	-----		2033	L 1.3
3	0533	H 4.8	11	0157	H 3.8	19	0019	L 1.2	27	0248	H 4.1
W	1149	L 0.8	Th	0801	L 1.4	F	0641	H 4.4	Sa	0857	L 1.4
	1748	H 4.2		1410	H 4.2		1309	L 1.4		1454	H 4.0
	2348	L 0.8		2030	L 1.0		1959	H 3.5		2101	L 1.1
4	0603	H 4.7	12	0240	H 4.2	20	0049	L 1.5	28	0316	H 4.4
Th	1222	L 1.0	F	0843	L 1.0	Sa	0717	H 4.1	Su	0928	L 1.1
	1819	H 3.9		1455	H 4.5		1352	L 1.7		1526	H 4.2
	----	-----		2106	L 0.8		1939	H 3.2		2129	L 0.9
5	0017	L 1.1	13	0310	H 4.6	21	0123	L 1.9	29	0343	H 4.6
F	0637	H 4.5	Sa	0929	L 0.7	Su	0800	H 3.7	M	0959	L 0.9
	1301	L 1.2		1535	H 4.6		1453	L 2.0		1557	H 4.2
	1855	H 3.7		2144	L 0.6		2042	H 2.8		2158	L 0.8
6	0050	L 1.4	14	0354	H 4.9	22	0216	L 2.2	30	0412	H 4.8
Sa	0717	H 4.2	Su	1009	L 0.5	M	0900	H 3.4	Tu	1030	L 0.8
	1348	L 1.5		1612	H 4.6		1646	L 2.2		1628	H 4.2
	1940	H 3.3		2216	L 0.5		2319	H 2.8		2226	L 0.8
7	0134	L 1.7	15	0428	H 5.0	23	0437	L 2.5			
Su	0812	H 3.8	M	1046	L 0.5	Tu	1112	H 3.2			
	1501	L 1.8		1647	H 4.5		1733	L 2.0			
	2055	H 3.9		2249	L 0.5		----	-----			
8	0246	L 2.0	16	0502	H 5.1	24	0512	H 3.1			
M	0943	H 3.6	Tu	1122	L 0.5	W	0950	L 2.3			
	1704	L 1.9		1721	H 4.4		1247	H 3.4			
	2315	H 3.9		2328	L 0.7		1927	L 1.7			

DAY	SUNRISE	SUNSET
1	0700	1912
11	0702	1922
21	0656	1943

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR MAY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0443	H 4.9	9	0022	H 3.5	17	0550	H 4.7	25	0129	H 3.7
W	1103	L 0.8	Th	0629	L 1.8	F	1219	L 1.1	Sa	0744	L 1.8
	1700	H 4.2		1230	H 3.7		1812	H 3.7		1331	H 3.5
	2257	L 0.8		1907	L 1.5		----	-----		1943	L 1.5
2	0514	H 4.9	10	0126	H 3.8	18	0001	L 1.2	26	0208	H 4.0
Th	1138	L 0.8	F	0738	L 1.5	Sa	0625	H 4.5	Su	0825	L 1.5
	1734	H 4.1		1341	H 3.9		1256	L 1.3		1417	H 3.7
	2329	L 0.9		1956	L 1.2		1849	H 3.5		2021	L 1.3
3	0549	H 4.8	11	0213	H 4.2	19	0035	L 1.5	27	0243	H 4.3
F	1216	L 0.9	Sa	0829	L 1.2	Su	0700	H 4.2	M	0904	L 1.2
	1811	H 3.8		1431	H 4.1		1336	L 1.5		1456	H 3.8
	----	-----		2037	L 1.0		1931	H 3.3		2056	L 1.1
4	0004	L 1.2	12	0255	H 4.6	20	0113	L 1.8	28	0317	H 4.6
Sa	0627	H 4.6	Su	0914	L 0.9	M	0739	H 3.8	Tu	0940	L 1.0
	1259	L 1.2		1513	H 4.2		1424	L 1.8		1533	H 3.9
	1843	H 3.6		2115	L 0.8		2027	H 3.1		2130	L 0.9
5	0044	L 1.4	13	0333	H 4.8	21	0203	L 2.1	29	0350	H 4.8
Su	0712	H 4.3	M	0954	L 0.8	Tu	0830	H 3.5	W	1016	L 0.8
	1350	L 1.4		1551	H 4.2		1529	L 1.9		1611	H 4.0
	1946	H 3.4		2150	L 0.8		2149	H 3.0		2205	L 0.8
6	0134	L 1.7	14	0409	H 5.0	22	0325	L 2.3	30	0426	H 4.9
M	0803	H 4.0	Tu	1031	L 0.7	W	0944	H 3.3	Th	1053	L 0.8
	1457	L 1.7		1627	H 4.2		1651	L 1.9		1648	H 4.1
	2102	H 3.2		2224	L 0.8		2329	H 3.1		2242	L 0.8
7	0250	L 2.0	15	0443	H 5.0	23	0523	L 2.4	31	0503	H 5.0
Tu	0927	H 3.8	W	1108	L 0.8	Th	1117	H 3.2	F	1132	L 0.8
	1629	L 1.8		1702	H 4.1		1806	L 1.8		1727	H 4.0
	2247	H 3.2		2256	L 0.8		----	----		2318	L 0.9
8	0444	L 2.1	16	0517	H 4.9	24	0042	H 3.4			
W	1109	H 3.6	Th	1143	L 0.8	F	0649	L 2.2			
	1801	L 1.7		1736	H 3.9		1236	H 3.4			
	----	-----		2326	L 1.1		1902	L 1.7			

DAY	SUNRISE	SUNSET
1	0652	1925
11	0649	1926
21	0647	1928
31	0646	1931

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR JUNE 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0542	H 4.9	9	0148	H 4.1	17	0023	L 1.4	25	0214	H 4.2
Sa	1212	L 0.8	Su	0813	L 1.5	M	0642	H 4.3	Tu	0843	L 1.4
	1808	H 3.8		1408	H 3.6		1313	L 1.2		1434	H 3.5
	----	-----		2009	L 1.3		1913	H 3.5		2028	L 1.2
2	0000	L 1.1	10	0235	H 4.4	18	0059	L 1.6	26	0256	H 4.5
Su	0623	H 4.8	M	0902	L 1.2	Tu	0716	H 4.0	W	0925	L 1.1
	1256	L 1.0		1456	H 3.8		1351	L 1.4		1519	H 3.8
	1853	H 3.8		2051	L 1.2		1956	H 3.4		2111	L 1.1
3	0044	L 1.2	11	0315	H 4.6	19	0141	L 1.8	27	0335	H 4.8
M	0709	H 4.5	Tu	0944	L 1.0	W	0755	H 3.8	Th	1005	L 0.8
	1345	L 1.2		1536	H 3.8		1432	L 1.6		1559	H 3.9
	1946	H 3.5		2129	L 1.0		2047	H 3.3		2152	L 0.8
4	0136	L 1.5	12	0353	H 4.8	20	0234	L 2.1	28	0415	H 4.9
Tu	0800	H 4.2	W	1022	L 0.9	Th	0842	H 3.5	F	1045	L 0.7
	1441	L 1.4		1614	H 3.8		1525	L 1.8		1640	H 4.1
	2049	H 3.5		2206	L 1.0		2154	H 3.2		2234	L 0.8
5	0242	L 1.8	13	0428	H 4.8	21	0350	L 2.2	29	0455	H 5.1
W	0905	H 3.8	Th	1057	L 0.8	F	0946	H 3.2	Sa	1123	L 0.6
	1550	L 1.5		1649	H 3.8		1632	L 1.8		1720	H 4.1
	2209	H 3.4		2240	L 1.0		2314	H 3.3		2314	L 0.8
6	0413	L 1.9	14	0502	H 4.8	22	0530	L 2.2	30	0535	H 5.0
Th	1026	H 3.5	F	1132	L 0.9	Sa	1114	H 3.2	Su	1203	L 0.6
	1708	L 1.6		1724	H 3.8		1746	L 1.8		1802	H 4.1
	2337	H 3.5		2315	L 1.1		----	-----		2356	L 0.8
7	0554	L 1.9	15	0536	H 4.7	23	0029	H 3.5			
F	1155	H 3.5	Sa	1205	L 1.0	Su	0656	L 2.0			
	1822	L 1.5		1759	H 3.8		1238	H 3.2			
	----	----		2349	L 1.2		1851	L 1.7			
8	0051	H 3.8	16	0609	H 4.5	24	0127	H 3.8			
Sa	0714	L 1.7	Su	1238	L 1.1	M	0755	L 1.7			
	1310	H 3.5		1835	H 3.6		1343	H 3.3			
	1921	L 1.5		----	-----		1943	L 1.5			

DAY	SUNRISE	SUNSET
5	0646	1933
15	0647	1936
25	0649	1938

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR JULY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0616	H 4.8	9	0222	H 4.2	17	0039	L 1.3	25	0240	H 4.4
M	1243	L 0.7	Tu	0857	L 1.4	W	0649	H 4.2	Th	0912	L 1.1
	1845	H 4.0		1448	H 3.4		1312	L 1.2		1508	H 3.7
	----	-----		2037	L 1.4		1919	H 3.8		2100	L 1.1
2	0040	L 1.0	10	0305	H 4.4	18	0113	L 1.5	26	0323	H 4.8
Tu	0659	H 4.6	W	0937	L 1.2	Th	0719	H 3.9	F	0952	L 0.8
	1326	L 0.9		1529	H 3.6		1343	L 1.4		1549	H 4.0
	1930	H 3.8		2118	L 1.2		1955	H 3.6		2144	L 0.8
3	0128	L 1.2	11	0342	H 4.5	19	0152	L 1.8	27	0404	H 5.0
W	0745	H 4.2	Th	1012	L 1.0	F	0755	H 3.6	Sa	1031	L 0.5
	1412	L 1.2		1605	H 3.8		1420	L 1.5		1628	H 4.2
	2022	H 3.7		2155	L 1.1		2042	H 3.5		2225	L 0.6
4	0224	L 1.5	12	0416	H 4.7	20	0244	L 2.0	28	0443	H 5.1
Th	0836	H 3.8	F	1045	L 0.9	Sa	0839	H 3.3	Su	1108	L 0.4
	1505	L 1.5		1637	H 3.8		1508	L 1.8		1707	H 4.4
	2126	H 3.6		2230	L 1.0		2147	H 3.4		2306	L 0.5
5	0336	L 1.8	13	0448	H 4.8	21	0406	L 2.2	29	0523	H 5.1
F	0941	H 3.5	Sa	1115	L 0.8	Su	0951	H 3.1	M	1145	L 0.4
	1611	L 1.7		1709	H 3.9		1622	L 1.9		1746	H 4.5
	2247	H 3.5		2303	L 1.0		2319	H 3.4		2347	L 0.5
6	0515	L 2.0	14	0519	H 4.7	22	0604	L 2.2	30	0602	H 4.9
Sa	1107	H 3.2	Su	1144	L 0.8	M	1145	H 2.9	Tu	1221	L 0.5
	1731	L 1.8		1741	H 3.9		1758	L 1.8		1825	H 4.4
	----	-----		2335	L 1.0		----	-----		----	-----
7	0014	H 3.6	15	0550	H 4.6	23	0046	H 3.6	31	0028	L 0.8
Su	0654	L 1.9	M	1213	L 0.9	Tu	0732	L 1.8	W	0641	H 4.6
	1241	H 3.2		1813	H 3.9		1319	H 3.1		1258	L 0.8
	1848	L 1.7		----	-----		1914	L 1.7		1905	H 4.2
8	0127	H 3.8	16	0006	L 1.2	24	0150	H 4.0			
M	0807	L 1.7	Tu	0619	H 4.4	W	0823	L 1.5			
	1355	H 3.2		1242	L 1.0		1420	H 3.4			
	1949	L 1.5		1844	H 3.8		2012	L 1.4			

DAY	SUNRISE	SUNSET
5	0652	1939
15	0655	1939
25	0657	1937

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR AUGUST 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0111	L 1.1	9	0330	H 4.4	17	0118	L 1.5	25	0349	H 5.0
Th	0720	H 4.2	F	0957	L 1.1	Sa	0715	H 3.7	Su	1010	L 0.5
	1337	L 1.1		1552	H 3.8		1329	L 1.4		1612	H 4.5
	1950	H 4.0		2145	L 1.1		1949	H 3.8		2215	L 0.5
2	0158	L 1.4	10	0400	H 4.6	18	0200	L 1.8	26	0428	H 5.2
F	0803	H 3.8	Sa	1024	L 0.8	Su	0753	H 3.4	M	1045	L 0.3
	1419	L 1.4		1621	H 4.0		1407	L 1.7		1648	H 4.8
	2041	H 3.8		2217	L 0.9		2041	H 3.5		2254	L 0.4
3	0258	L 1.8	11	0430	H 4.7	19	0307	L 2.1	27	0505	H 5.1
Sa	0854	H 3.3	Su	1051	L 0.8	M	0852	H 3.0	Tu	1120	L 0.3
	1512	L 1.8		1649	H 4.2		1509	L 1.9		1724	H 4.8
	2151	H 3.5		2247	L 0.8		2210	H 3.4		2332	L 0.4
4	0432	L 2.1	12	0457	H 4.7	20	0518	L 2.2	28	0542	H 4.9
Su	1016	H 2.9	M	1116	L 0.7	Tu	1101	H 2.8	W	1153	L 0.5
	1633	L 2.0		1717	H 4.2		1710	L 2.1		1800	H 4.7
	2337	H 3.5		2316	L 0.8		----	-----		----	-----
5	0645	L 2.1	13	0525	H 4.6	21	0010	H 3.5	29	0010	L 0.6
M	1229	H 2.8	Tu	1141	L 0.8	W	0714	L 1.9	Th	0617	H 4.5
	1824	L 2.0		1744	H 4.2		1308	H 3.0		1227	L 0.8
	----	-----		2345	L 0.9		1858	L 1.8		1837	H 4.5
6	0113	H 3.6	14	0552	H 4.5	22	0131	H 3.9	30	0050	L 0.9
Tu	0808	L 1.8	W	1207	L 0.8	Th	0812	L 1.5	F	0654	H 4.2
	1357	H 3.1		1813	H 4.2		1410	H 3.4		1300	L 1.1
	1942	L 1.8		----	-----		2002	L 1.5		1916	H 4.2
7	0213	H 3.9	15	0014	L 1.1	23	0224	H 4.3	31	0132	L 1.4
W	0854	L 1.5	Th	0618	H 4.3	F	0856	L 1.1	Sa	0730	H 3.7
	1446	H 3.3		1232	L 1.0		1455	H 3.8		1334	L 1.5
	2032	L 1.5		1841	H 4.1		2051	L 1.1		1958	H 3.8
8	0256	H 4.2	16	0044	L 1.3	24	0309	H 4.7			
Th	0927	L 1.2	F	0646	H 4.0	Sa	0934	L 0.7			
	1522	H 3.5		1259	L 1.2		1534	H 4.2			
	2111	L 1.3		1911	H 3.9		2134	L 0.7			

DAY	SUNRISE	SUNSET
4	0659	1935
14	0700	1931
24	0701	1926

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR SEPTEMBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0223	L 1.8	9	0406	H 4.6	17	0236	L 2.0	25	0444	H 4.9
Su	0812	H 3.2	M	1020	L 0.8	Tu	0823	H 3.0	W	1052	L 0.4
	1414	L 1.8		1623	H 4.5		1422	L 2.0		1701	H 5.1
	2058	H 3.5		2227	L 0.8		2121	H 3.5		2315	L 0.4
2	0350	L 2.2	10	0432	H 4.6	18	0445	L 2.2	26	0520	H 4.7
M	0925	H 2.8	Tu	1044	L 0.7	W	1043	H 2.8	Th	1124	L 0.5
	1526	L 2.2		1649	H 4.5		1638	L 2.2		1736	H 4.9
	2251	H 3.3		2255	L 0.8		2336	H 3.5		2353	L 0.6
3	0639	L 2.2	11	0458	H 4.5	19	0649	L 1.8	27	0554	H 4.4
Tu	1235	H 2.7	W	1108	L 0.7	Th	1254	H 3.1	F	1157	L 0.8
	1811	L 2.3		1714	H 4.5		1845	L 1.9		1811	H 4.7
	----	-----		2322	L 0.8		----	-----		----	-----
4	0057	H 3.5	12	0524	H 4.5	20	0108	H 3.8	28	0030	L 0.9
W	0800	L 1.8	Th	1132	L 0.8	F	0749	L 1.5	Sa	0628	H 4.0
	1359	H 3.0		1740	H 4.5		1354	H 3.5		1227	L 1.1
	1938	L 2.0		2350	L 0.9		1951	L 1.5		1846	H 4.4
5	0200	H 3.8	13	0550	H 4.2	21	0205	H 4.2	29	0109	L 1.3
Th	0837	L 1.5	F	1156	L 0.9	Sa	0832	L 1.1	Su	0703	H 3.5
	1437	H 3.4		1807	H 4.5		1437	H 4.0		1257	L 1.5
	2025	L 1.7		----	-----		2038	L 1.0		1924	H 4.0
6	0239	H 4.0	14	0019	L 1.1	22	0251	H 4.6	30	0157	L 1.8
F	0906	L 1.3	Sa	0617	H 4.0	Su	0909	L 0.7	M	0742	H 3.2
	1507	H 3.7		1221	L 1.1		1515	H 4.5		1332	L 1.8
	2100	L 1.4		1837	H 4.2		2120	L 0.6		2013	H 3.6
7	0311	H 4.3	15	0053	L 1.4	23	0330	H 4.8			
Sa	0931	L 1.1	Su	0647	H 3.7	M	0944	L 0.5			
	1533	H 4.0		1250	L 1.4		1551	H 4.8			
	2131	L 1.2		1911	H 4.0		2200	L 0.4			
8	0339	H 4.5	16	0134	L 1.6	24	0408	H 4.9			
Su	0956	L 0.8	M	0724	H 3.3	Tu	1019	L 0.3			
	1558	H 4.2		1325	L 1.7		1626	H 5.0			
	2159	L 0.9		1959	H 3.8		2238	L 0.3			

DAY	SUNRISE	SUNSET
3	0701	1920
13	0700	1913
23	0700	1907

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR OCTOBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0312	L 2.1	9	0405	H 4.4	17	0413	L 1.9	25	0500	H 4.4
Tu	0851	H 2.8	W	1011	L 0.7	Th	1025	H 2.9	F	1059	L 0.6
	1427	L 2.2		1622	H 4.7		1613	L 2.2		1716	H 5.0
	2148	H 3.3		2233	L 0.8		2259	H 3.5		2338	L 0.6
2	0555	L 2.2	10	0432	H 4.4	18	0609	L 1.8	26	0534	H 4.2
W	1217	H 2.7	Th	1036	L 0.7	F	1226	H 3.2	Sa	1131	L 0.8
	1736	L 2.5		1648	H 4.8		1822	L 1.9		1750	H 4.8
	----	-----		2302	L 0.7		----	-----		----	-----
3	0016	H 3.3	11	0459	H 4.3	19	0038	H 3.7	27	0015	L 0.8
Th	0726	L 1.9	F	1101	L 0.8	Sa	0716	L 1.4	Su	0609	H 3.8
	1342	H 3.1		1714	H 4.8		1329	H 3.7		1203	L 1.1
	1922	L 2.2		2331	L 0.8		1932	L 1.5		1825	H 4.5
4	0130	H 3.5	12	0527	H 4.2	20	0140	H 4.1	28	0054	L 1.2
F	0804	L 1.6	Sa	1127	L 0.9	Su	0802	L 1.1	M	0645	H 3.5
	1415	H 3.4		1743	H 4.6		1413	H 4.2		1234	L 1.5
	2007	L 1.8		----	-----		2022	L 1.1		1901	H 4.1
5	0210	H 3.8	13	0003	L 1.0	21	0228	H 4.3	29	0138	L 1.5
Sa	0832	L 1.4	Su	0557	H 3.9	M	0842	L 0.8	Tu	0726	H 3.2
	1441	H 3.8		1154	L 1.1		1453	H 4.5		1309	L 1.8
	2040	L 1.5		1814	H 4.5		2105	L 0.7		1944	H 3.7
6	0242	H 4.0	14	0038	L 1.2	22	0310	H 4.5	30	0237	L 1.8
Su	0857	L 1.2	M	0631	H 3.6	Tu	0918	L 0.5	W	0828	H 2.8
	1506	H 4.1		1225	L 1.3		1530	H 4.8		1401	L 2.2
	2110	L 1.2		1851	H 4.2		2145	L 0.5		2048	H 3.4
7	0311	H 4.2	15	0122	L 1.5	23	0348	H 4.6	31	0421	L 2.1
M	0922	L 0.9	Tu	0713	H 3.3	W	0953	L 0.5	Th	1042	H 2.8
	1531	H 4.4		1304	L 1.6		1606	H 5.1		1609	L 2.4
	2138	L 1.0		1939	H 3.9		2224	L 0.4		2246	H 3.2
8	0338	H 4.3	16	0226	L 1.8	24	0425	H 4.5			
Tu	0946	L 0.8	W	0817	H 3.0	Th	1027	L 0.5			
	1556	H 4.5		1405	L 2.0		1641	H 5.1			
	2206	L 0.8		2057	H 3.6		2302	L 0.5			

DAY	SUNRISE	SUNSET
3	0700	1906
13	0700	1854
23	0701	1849

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR NOVEMBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0614	L 1.9	9	0442	H 4.1	17	----	-----	25	0004	L 0.8
F	1245	H 3.0	Sa	1038	L 0.8	Su	0633	L 1.5	M	0557	H 3.7
	1834	L 2.2		1656	H 4.8		1254	H 3.6		1148	L 1.0
	----	-----		2320	L 0.7		1909	L 1.5		1810	H 4.5
2	0028	H 3.2	10	0514	H 3.9	18	0110	H 3.7	26	0041	L 0.9
Sa	0711	L 1.8	Su	1108	L 0.8	M	0728	L 1.2	Tu	0633	H 3.5
	1333	H 3.3		1728	H 4.8		1348	H 4.1		1222	L 1.3
	1934	L 2.0		2355	L 0.8		2006	L 1.2		1845	H 4.2
3	0126	H 3.5	11	0549	H 3.8	19	0205	H 3.8	27	0119	L 1.3
Su	0748	L 1.5	M	1141	L 1.0	Tu	0813	L 0.9	W	0713	H 3.2
	1406	H 3.7		1304	H 4.6		1431	H 4.5		1258	L 1.6
	2013	L 1.6		----	-----		2052	L 0.8		1921	H 3.8
4	0206	H 3.7	12	0034	L 1.0	20	0251	H 4.0	28	0203	L 1.5
M	0818	L 1.2	Tu	0627	H 3.6	W	0854	L 0.8	Th	0801	H 3.1
	1435	H 4.0		1218	L 1.2		1512	H 4.7		1343	L 1.9
	2046	L 1.3		1844	H 4.3		2135	L 0.6		2006	H 3.5
5	0240	H 3.8	13	0120	L 1.2	21	0332	H 4.2	29	0259	L 1.7
Tu	0846	L 1.1	W	0714	H 3.4	Th	0931	L 0.6	F	0912	H 2.9
	1502	H 4.3		1303	L 1.5		1549	H 4.9		1451	L 2.2
	2116	L 1.1		1932	H 4.0		2214	L 0.5		2108	H 3.2
6	0311	H 4.0	14	0218	L 1.5	22	0409	H 4.2	30	0419	L 1.8
W	0914	L 0.9	Th	0817	H 3.2	F	1007	L 0.6	Sa	1057	H 2.9
	1530	H 4.5		1405	L 1.8		1625	H 5.0		1653	L 2.3
	2146	L 0.8		2039	H 3.7		2251	L 0.5		2244	H 3.1
7	0341	H 4.1	15	0338	L 1.7	23	0446	H 4.1			
Th	0941	L 0.8	F	0952	H 3.1	Sa	1041	L 0.7			
	1558	H 4.7		1546	L 2.0		1700	H 4.9			
	2216	L 1.1		2216	H 3.5		2329	L 0.6			
8	0411	H 4.1	16	0516	L 1.6	24	0521	H 3.9			
F	1010	L 0.8	Sa	1140	H 3.2	Su	1115	L 0.8			
	1627	H 4.8		1748	L 1.9		1735	H 4.8			
	2248	L 0.7		2357	H 3.5		----	-----			

DAY	SUNRISE	SUNSET
2	0704	1845
12	0706	1844
22	0710	1844

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR DECEMBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0543	L 1.8	9	0508	H 3.9	17	0036	H 3.3	25	0023	L 0.8
Su	1225	H 3.2	M	1101	L 0.8	Tu	0652	L 1.4	W	0619	H 3.7
	1838	L 2.2		1721	H 4.8		1323	H 3.8		1210	L 1.1
	----	-----		2351	L 0.6		1952	L 1.4		1828	H 4.3
2	0016	H 3.1	10	0546	H 3.8	18	0145	H 3.4	26	0055	L 0.9
M	0647	L 1.7	Tu	1138	L 0.8	W	0749	L 1.2	Th	0654	H 3.5
	1319	H 3.5		1759	H 4.7		1416	H 4.2		1245	L 1.3
	1938	L 1.8		----	-----		2045	L 1.1		1859	H 4.1
3	0120	H 3.2	11	0030	L 0.8	19	0238	H 3.5	27	0128	L 1.2
Tu	0732	L 1.5	W	0626	H 3.7	Th	0836	L 1.0	F	0731	H 3.4
	1400	H 3.8		1218	L 1.0		1500	H 4.5		1321	L 1.5
	2020	L 1.5		1839	H 4.5		2129	L 0.8		1932	H 3.8
4	0207	H 3.4	12	0113	L 0.9	20	0322	H 3.7	28	0204	L 1.4
W	0810	L 1.2	Th	0711	H 3.5	F	0917	L 0.8	Sa	0814	H 3.2
	1435	H 4.1		1304	L 1.2		1539	H 4.7		1404	L 1.8
	2057	L 1.2		1926	H 4.2		2209	L 0.7		2010	H 3.4
5	0247	H 3.5	13	0200	L 1.2	21	0401	H 3.8	29	0248	L 1.6
Th	0845	L 1.1	F	0804	H 3.4	Sa	0954	L 0.8	Su	0911	H 3.2
	1507	H 4.4		1359	L 1.5		1615	H 4.8		1505	L 2.1
	2131	L 1.0		2020	H 3.8		2245	L 0.6		2101	H 3.1
6	0322	H 3.7	14	0259	L 1.4	22	0438	H 3.8	30	0348	L 1.8
F	0918	L 0.9	Sa	0914	H 3.3	Su	1030	L 0.8	M	1034	H 3.1
	1539	H 4.6		1514	L 1.8		1650	H 4.8		1653	L 2.2
	2205	L 0.8		2131	H 3.5		2319	L 0.6		2228	H 2.9
7	0358	H 3.8	15	0415	L 1.5	23	0512	H 3.8	31	0513	L 1.8
Sa	0951	L 0.8	Su	1043	H 3.3	M	1104	L 0.8	Tu	1210	H 3.2
	1612	H 4.8		1702	L 1.8		1723	H 4.7		1848	L 2.1
	2239	L 0.6		2304	H 3.3		2351	L 0.7		----	-----
8	0432	H 3.9	16	0540	L 1.5	24	0545	H 3.8			
Su	1025	L 0.7	M	1213	H 3.5	Tu	1137	L 0.8			
	1646	H 4.8		1842	L 1.7		1756	H 4.5			
	2314	L 0.6		----	-----		----	-----			

DAY	SUNRISE	SUNSET
2	0715	1845
12	0721	1848
22	0726	1853

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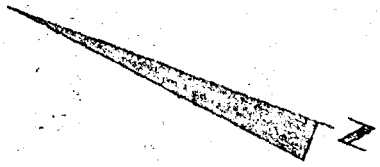
DECLASSIFIED PER DOE
[illegible] DATED JULY, 15, 1994
JOHN ANTON SINISCALLI TO
DIANE S. NIXON



SCALE 1"=300'

△ ALICE

Camera Bunker at highest [illegible] E 53,000

OCEAN

LAGOON

N 138,000

E 52,000

N 137,000

E 51,000

P.I. "C"

P.I. "C" N 138,387.19 E 51,196.73

ALICE N 138,951.392 E 52,852.227

△ TO DATE 11-30-55 AM

DATE 4-1-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED J.O.	SITE ALICE

OFFICIAL USE ONLY

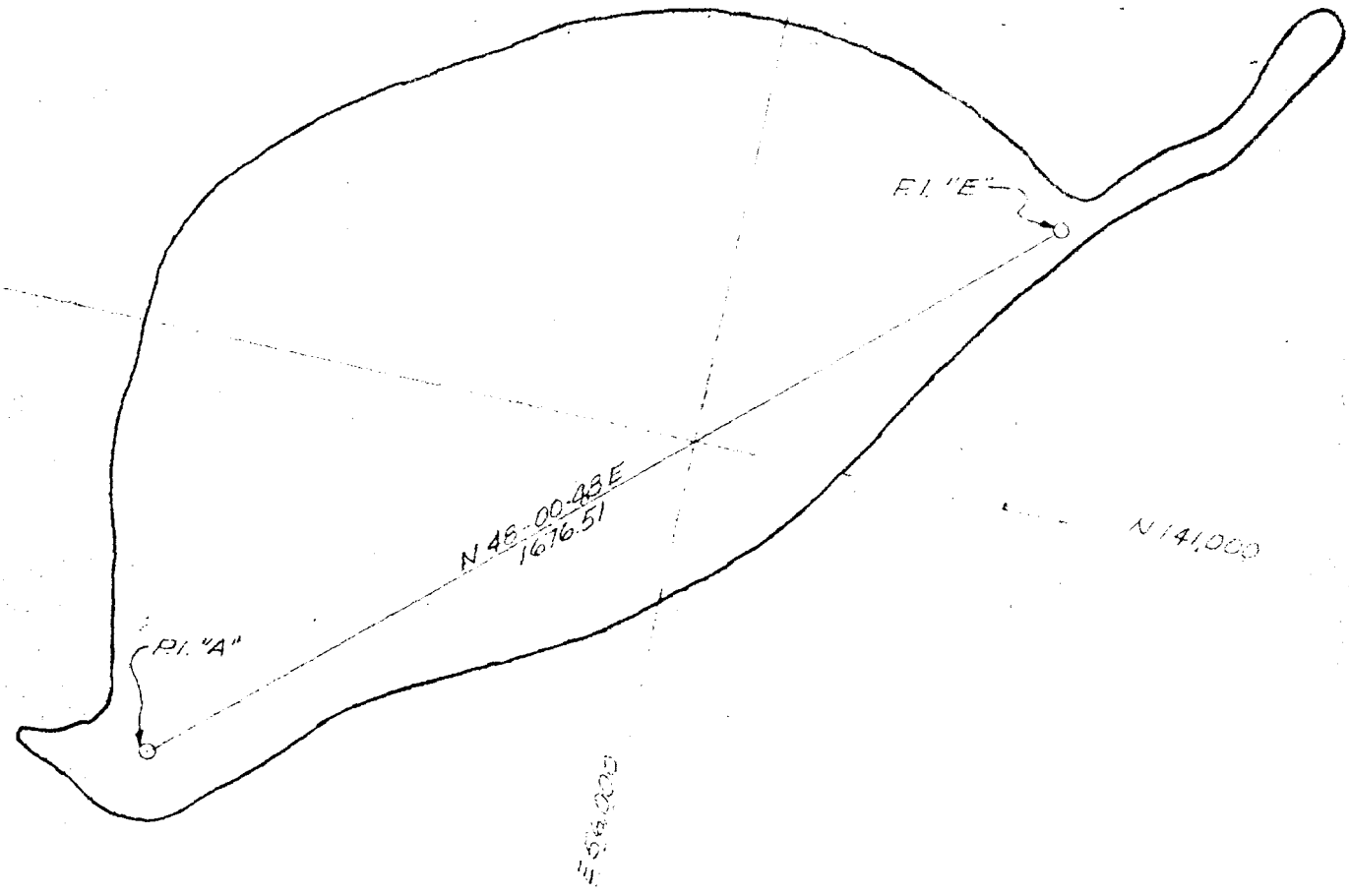
OFFICIAL USE ONLY

P.I. "A" N 140,329.99 E 55,256.51 ELEV. 8.06

P.I. "E" N 141,451.50 E 56,502.66 ELEV. 8.16

N

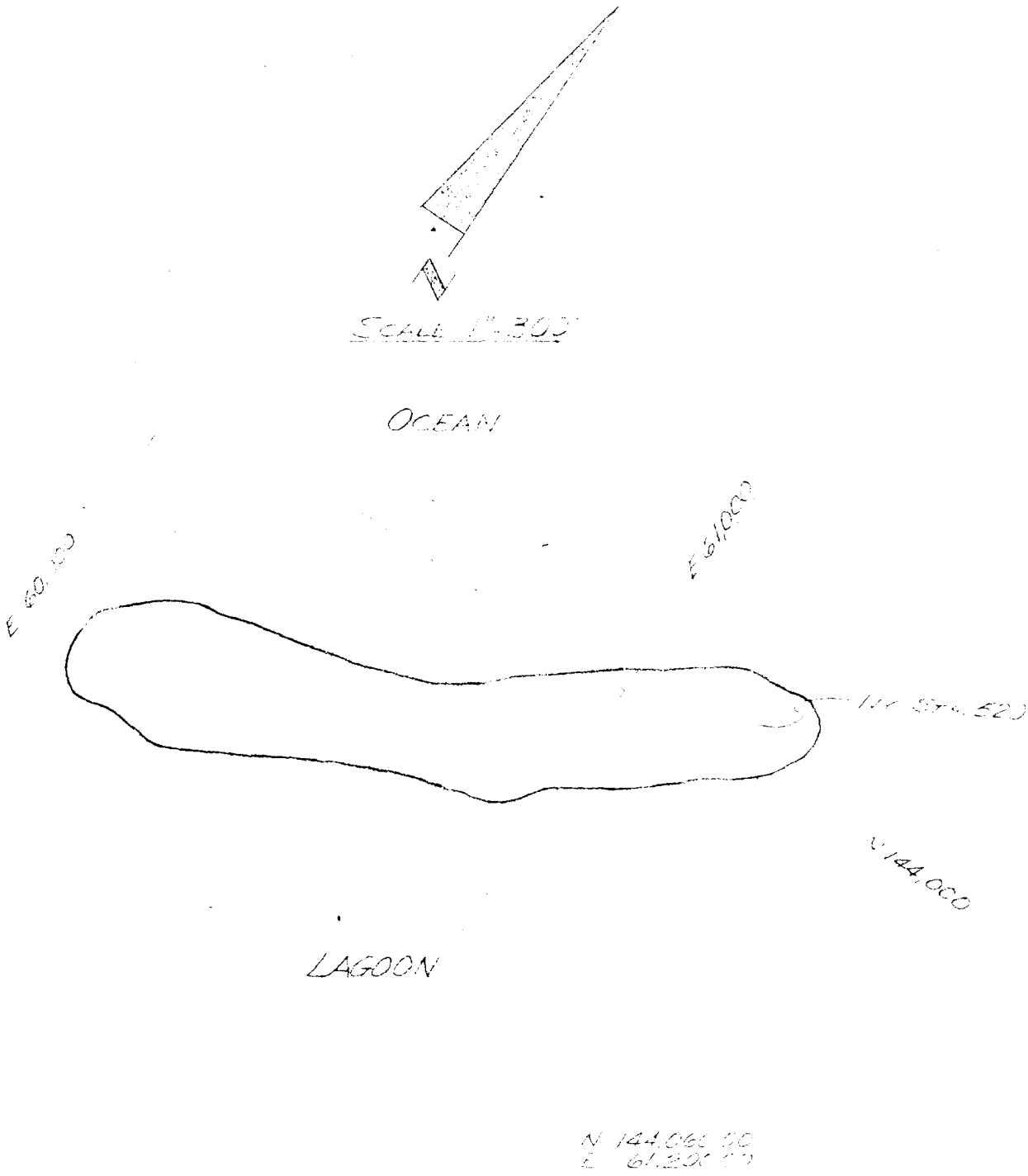
SCALE 1" = 300'



DATE 4-19-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED JD	SITE BELLE

OFFICIAL USE ONLY

~~OFFICIAL USE ONLY~~

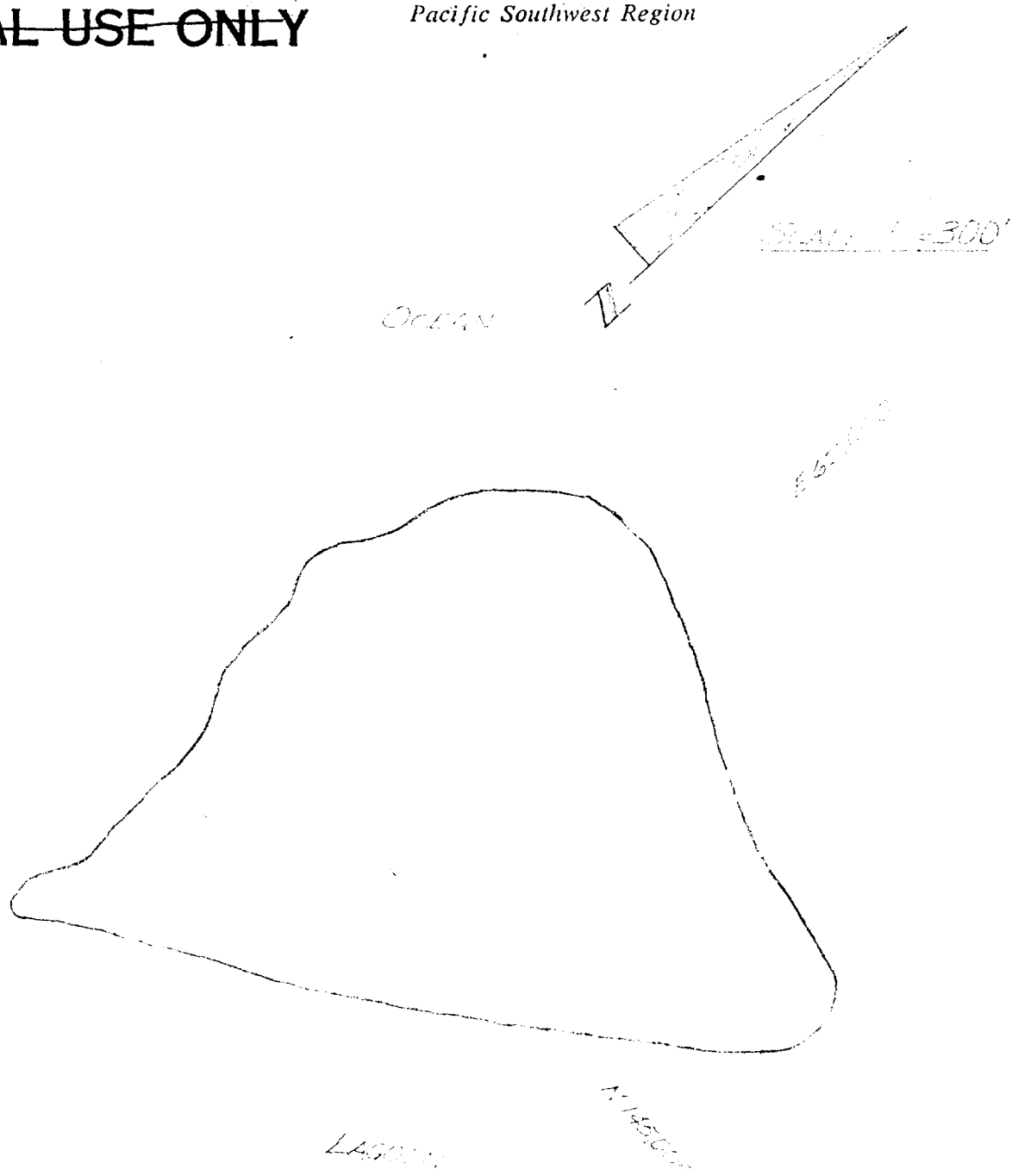


N 144,066.66
E 61,200.00

DATE 4-14-84		GENERAL CONTROL LAYOUT
DRAWING E-	CHECKED	SITE CLASH

~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~



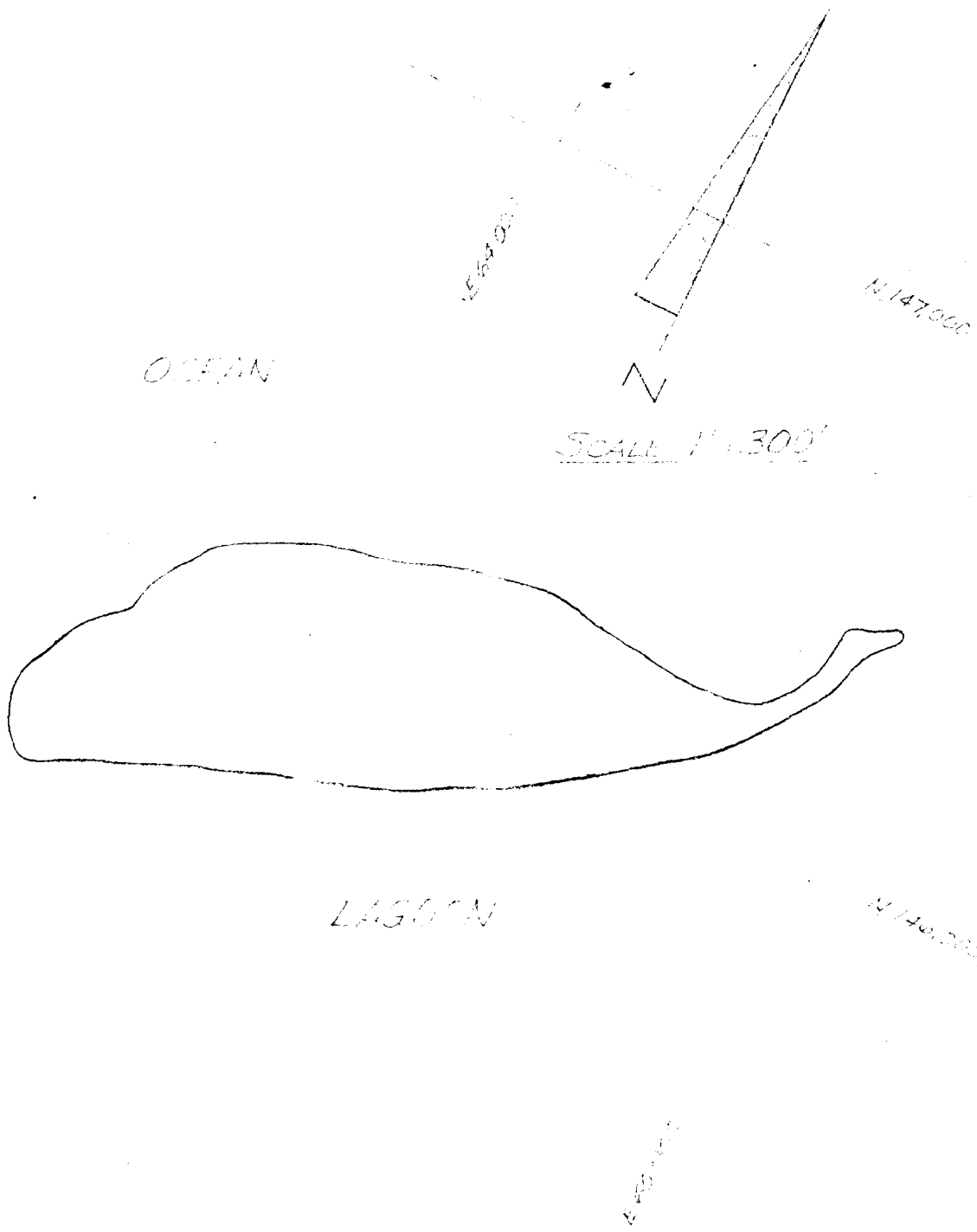
DATE 4-1-54

DRAWN ES

GENERAL CONTROL UNIT

~~OFFICIAL USE ONLY~~

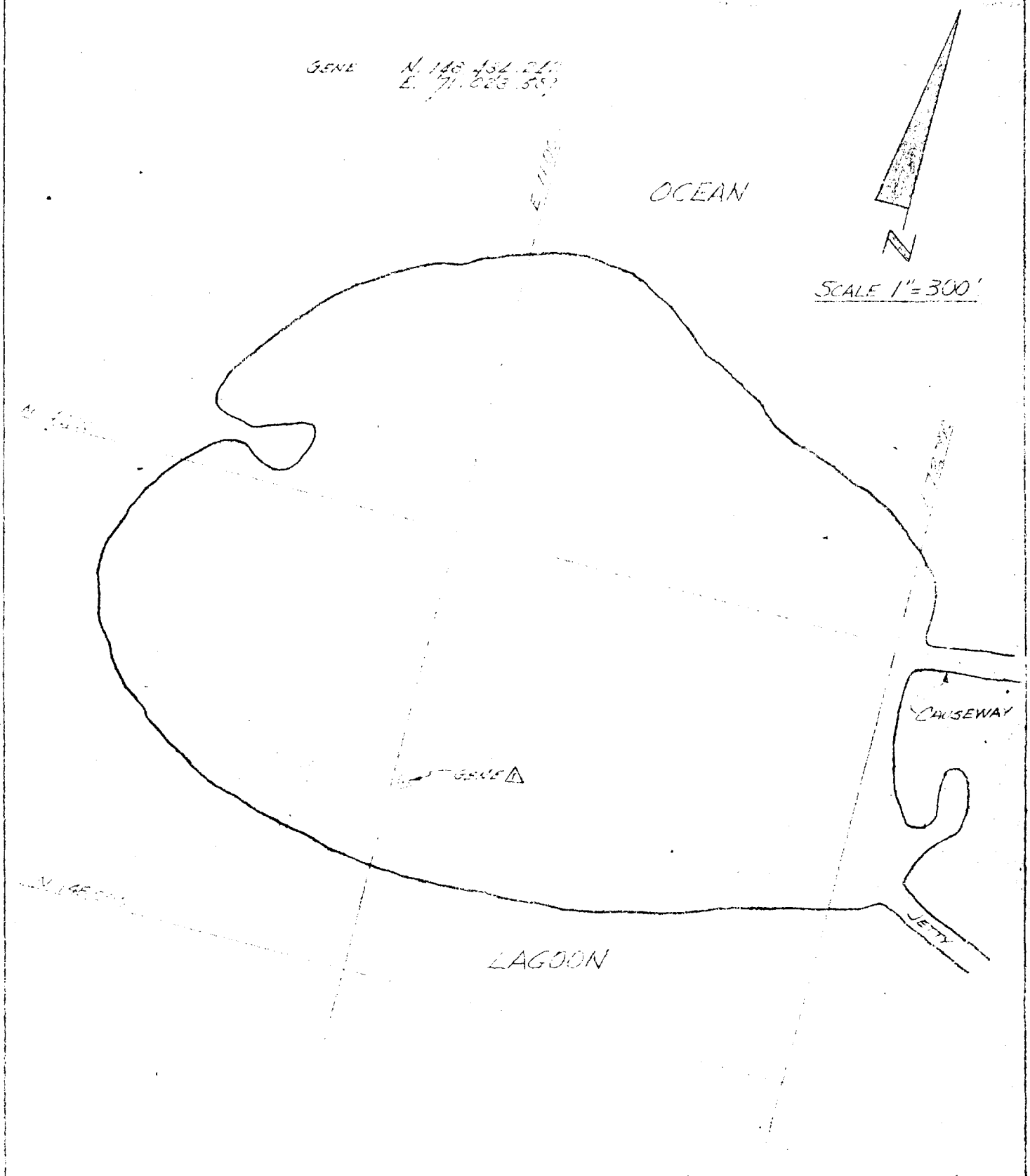
OFFICIAL USE ONLY



OFFICIAL USE ONLY

DATE 4-19-57		GENERAL PATROL LAYOUT
DRAWN ES	CHECKED JD	SITE ELNA

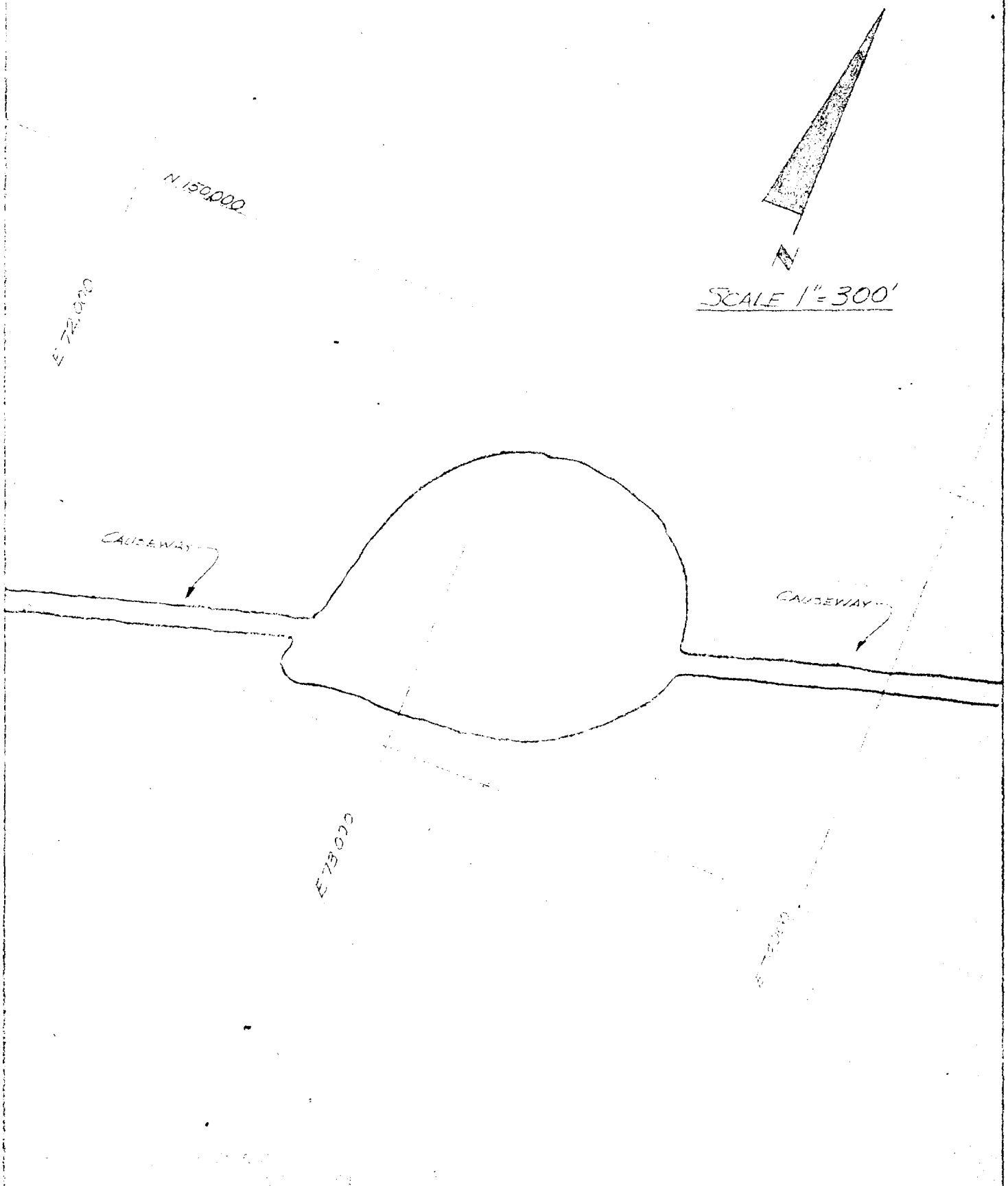
~~OFFICIAL USE ONLY~~



△ TO DATE 11-30-55 AM

~~OFFICIAL USE ONLY~~

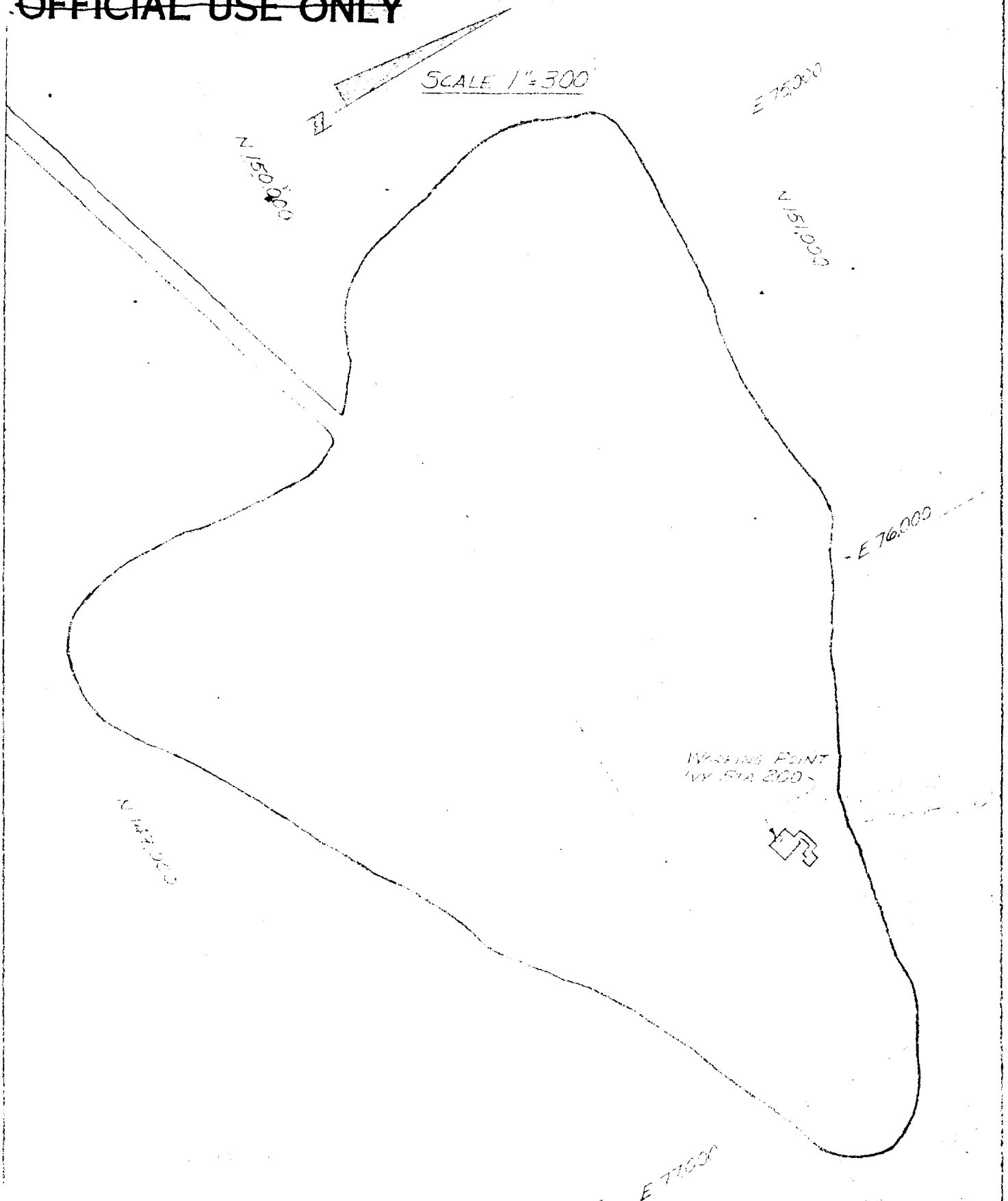
DATE 4-16-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED	SITE GENE



L to DATE 11-30-55 AM

DATE 4-16-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED MMM	SITE HELEN

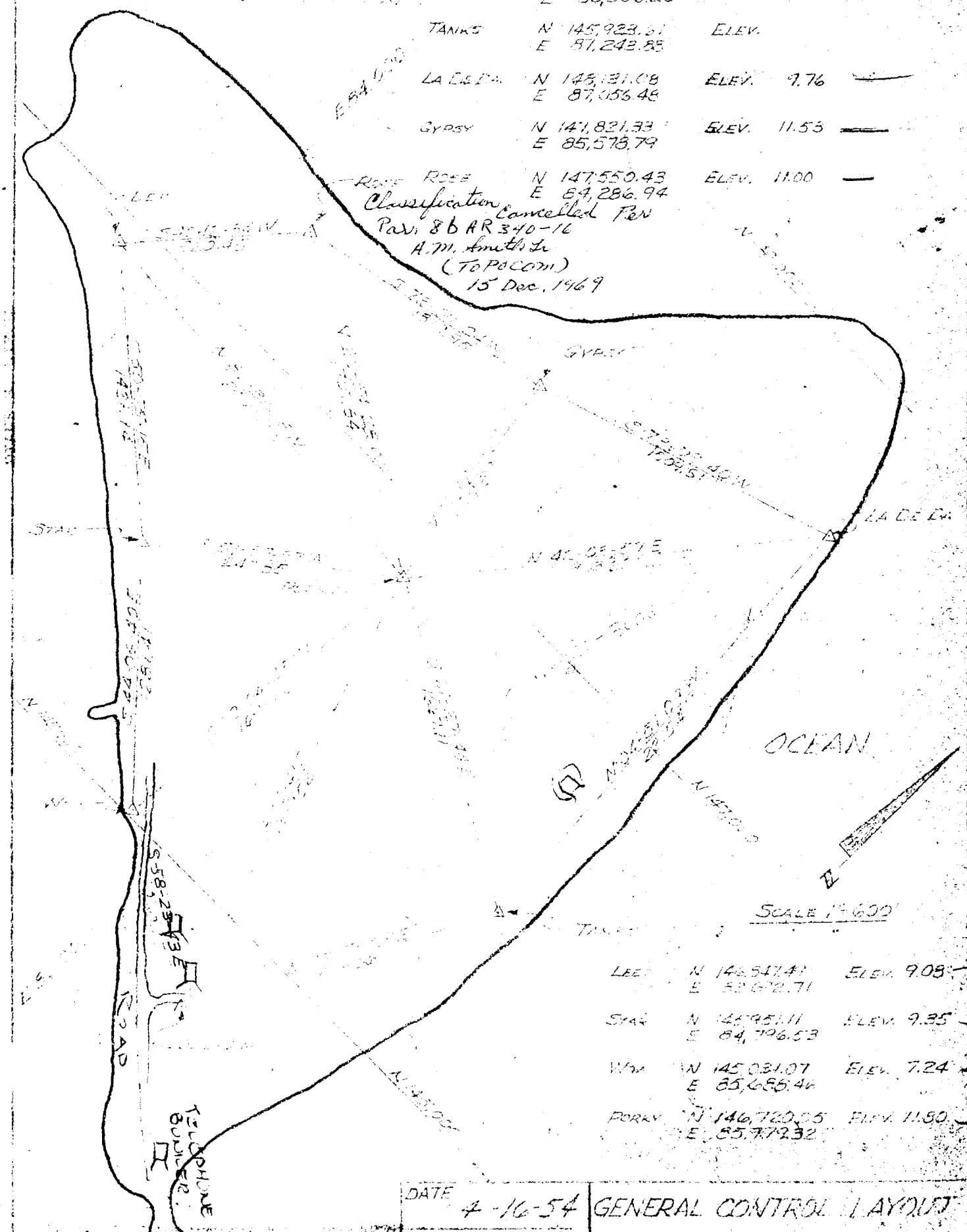
~~OFFICIAL USE ONLY~~



~~OFFICIAL USE ONLY~~

△ To DATE 11-30-55 AM		
DATE 4-16-54		GENERAL CONTROL LAYOUT
DRAWN E.S.	CHECKED J.O.	SITE IRENE

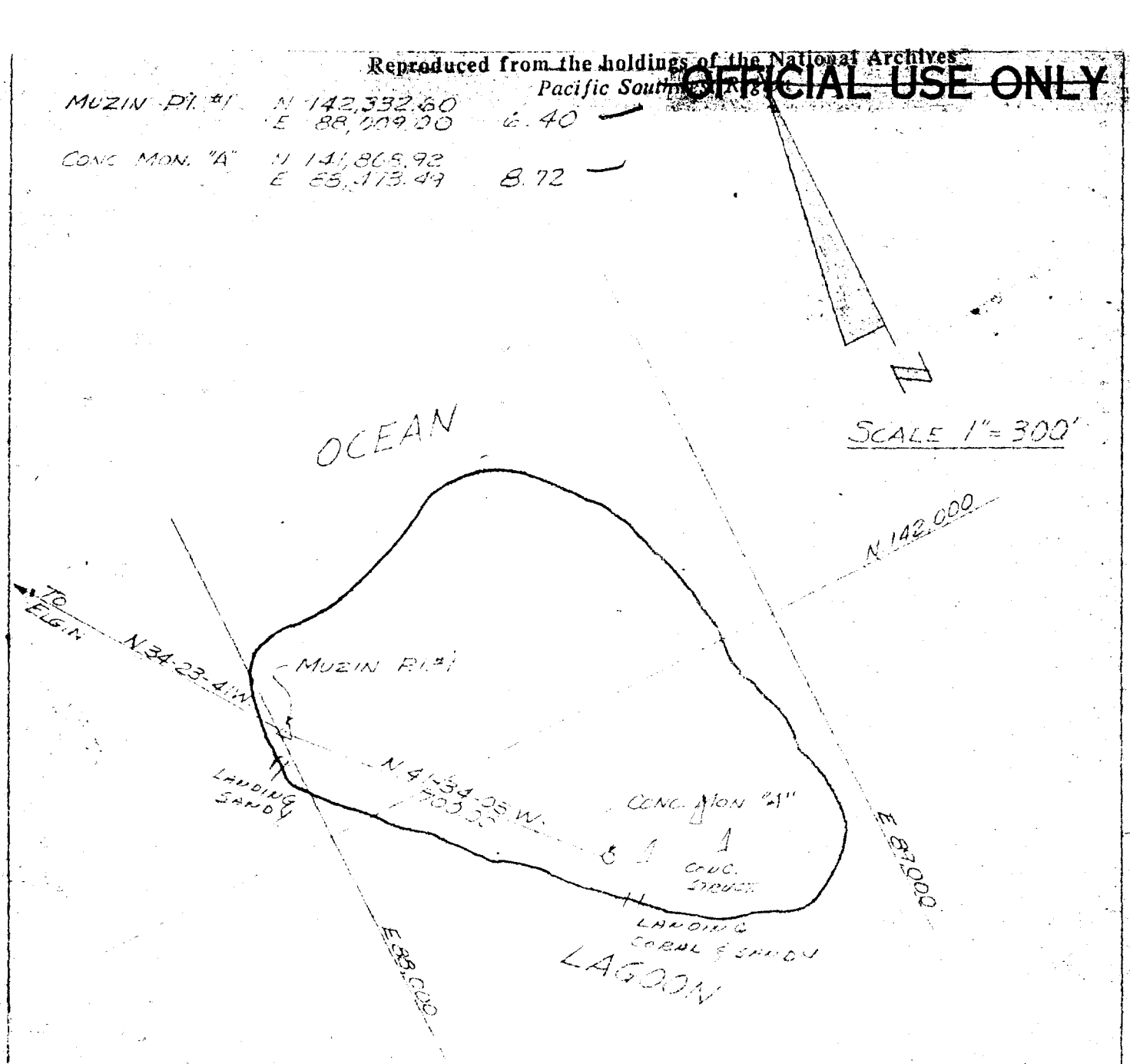
W.B. STA. 78+ N 150,245.57
E 76,457.66



DATE	4-16-54	GENERAL CONTROL LAYOUT
DRAWN	CHECKED	
E.C.	J.O.	S.T.F. JANET

MUZIN PT. #1 N 142,332.60 E 88,909.00 6.40

CONC MON. "A" N 141,869.92 E 88,173.49 8.72



DATE 4-17-54	GENERAL CONTROL LAYOUT
DRAWN E.S. / CHECKED J.C.	SITE KATE

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USN BEACON M'S N 139,577.00 ELEV. 5.60
H&AI & KIONIAN S E 90,569.00

OCEAN

E 9,000

N

SCALE 1" = 300'

N 141,000

N 140,000

TO ELGIN N 41-06-12.3 W

USN BEACON "M"
H&N KIONIAN
LSTER - USN 1944

LANDING
CORAL & SANDY

LAGOON

S 13-18-45.5 E TO COPAL

E 20,000

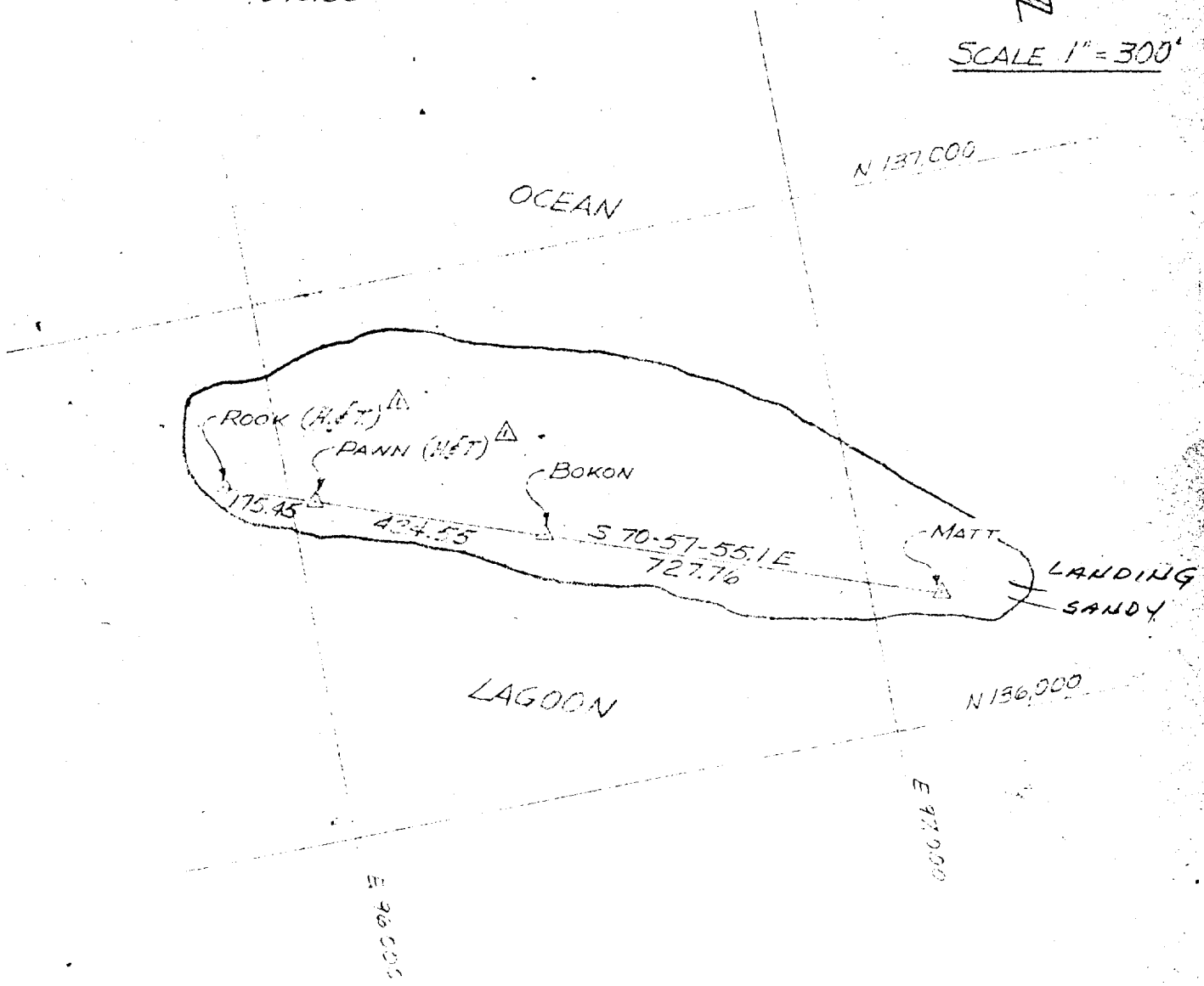
OFFICIAL USE ONLY

DATE 4-17-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED J.O.	SITE LUCY

BOKON	N 136 470.80 E 96,44 1.70	ELEV.	10.40
MATT	N 136,233.45 E 97,129.67	ELEV.	9.53
ROOK	N 136,666.48 E 95,874.51	ELEV.	10.04
PAWN	N 136,609.26 E 96,040.36	ELEV.	8.64

N

SCALE 1" = 300'

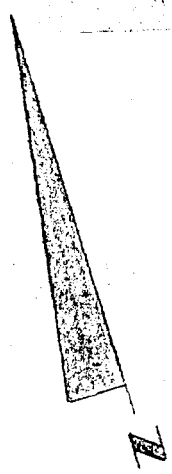


△ TO DATE 11-30-55 MH

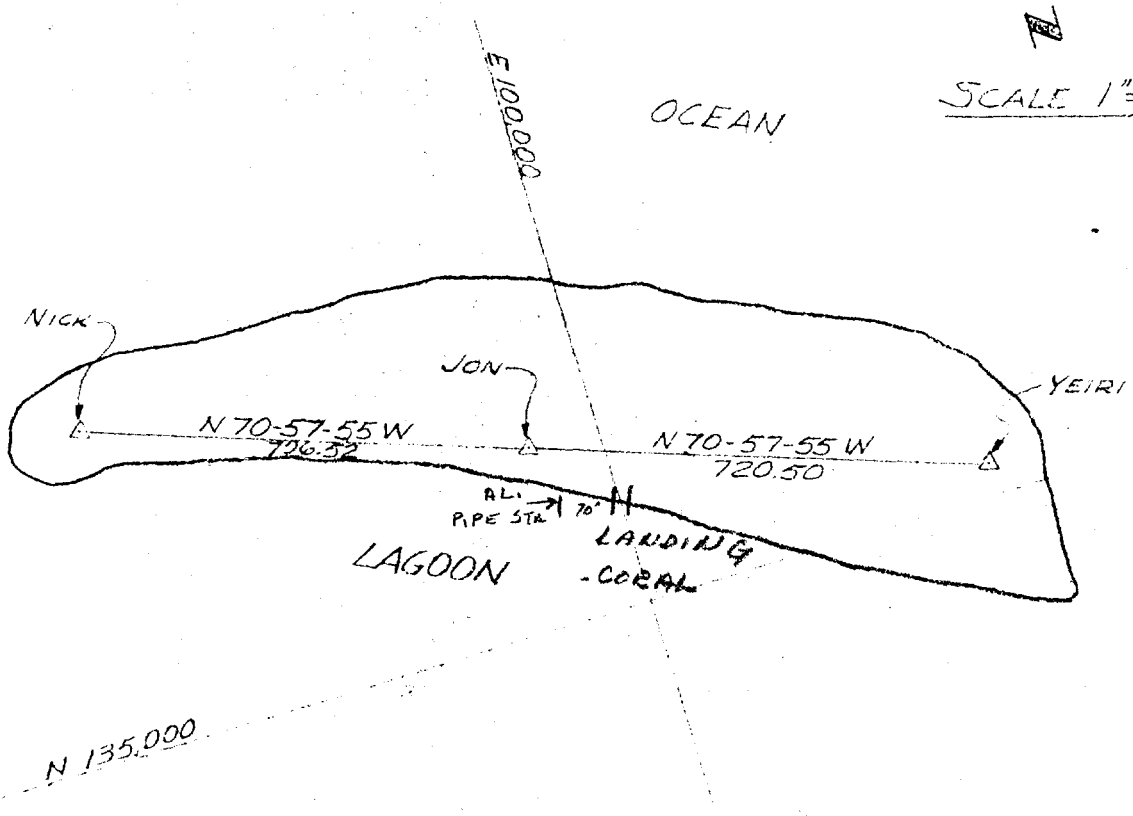
DATE		GENERAL CONTROL LAYOUT
4-19-54		
DRAWN	CHECKED	SITE MARY
ES	J.O.	

~~OFFICIAL USE ONLY~~

YEIRI	N 135,047.55 E [illegible]2,567.01	ELEV	9.96
NICK	N 135,512.99 E 99,218.02	ELEV.	10.54
JON	N 135,282.56 E 99,885.91		



SCALE 1"=300'



N 135,000

~~OFFICIAL USE ONLY~~

DATE 4-11-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED J.O.	SITE NANCY

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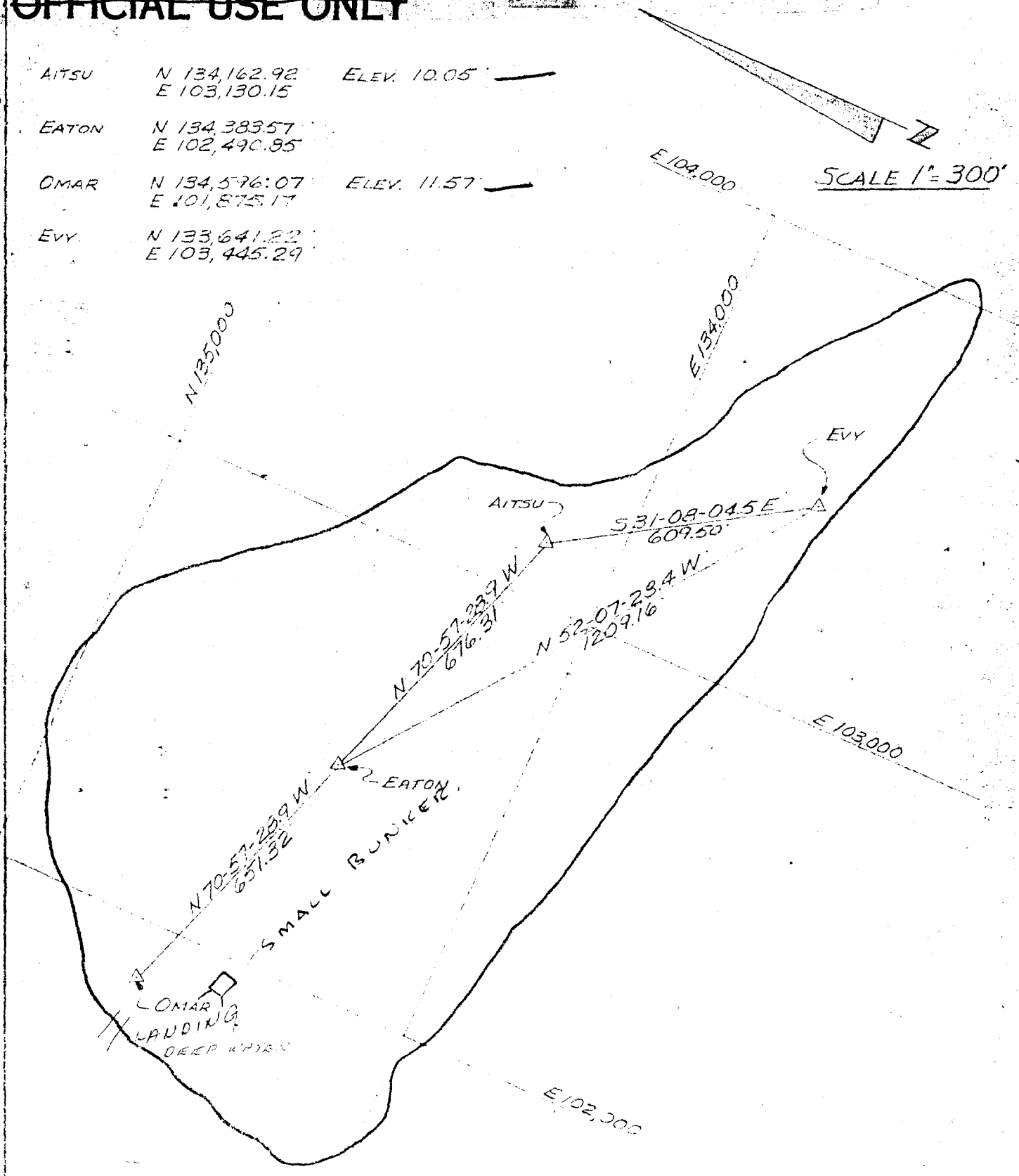
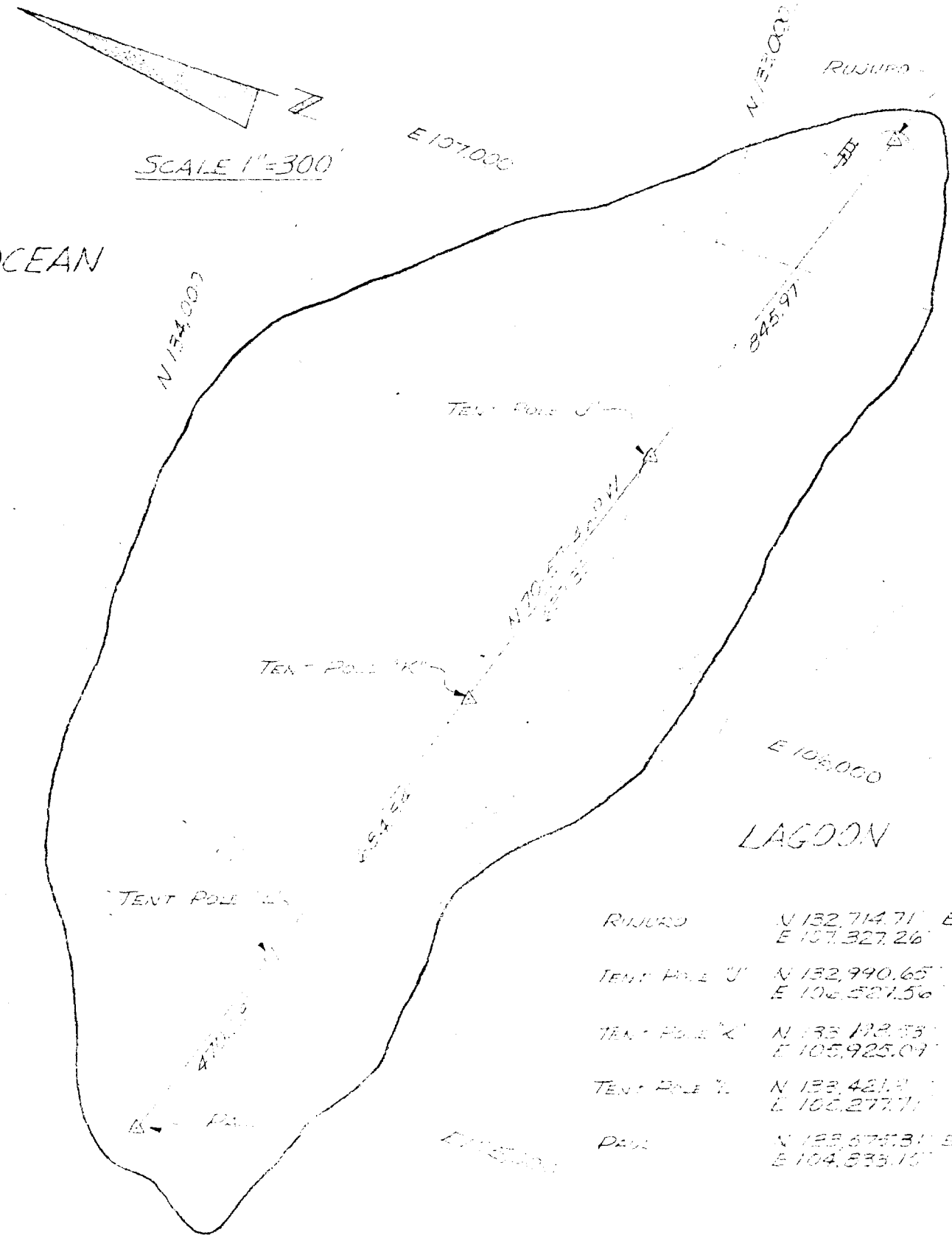
AITSU	N 134,162.92 E 103,130.15	ELEV. 10.05
EATON	N 134,383.57 E 102,490.85	
OMAR	N 134,596.07 E 101,875.17	ELEV. 11.57
EVY	N 133,641.22 E 103,445.29	



DATE 4-19-54		GENERAL CONTROL LAYOUT
DRAWN ES.	CHECKED J.C.	SITE OLIVE

OFFICIAL USE ONLY

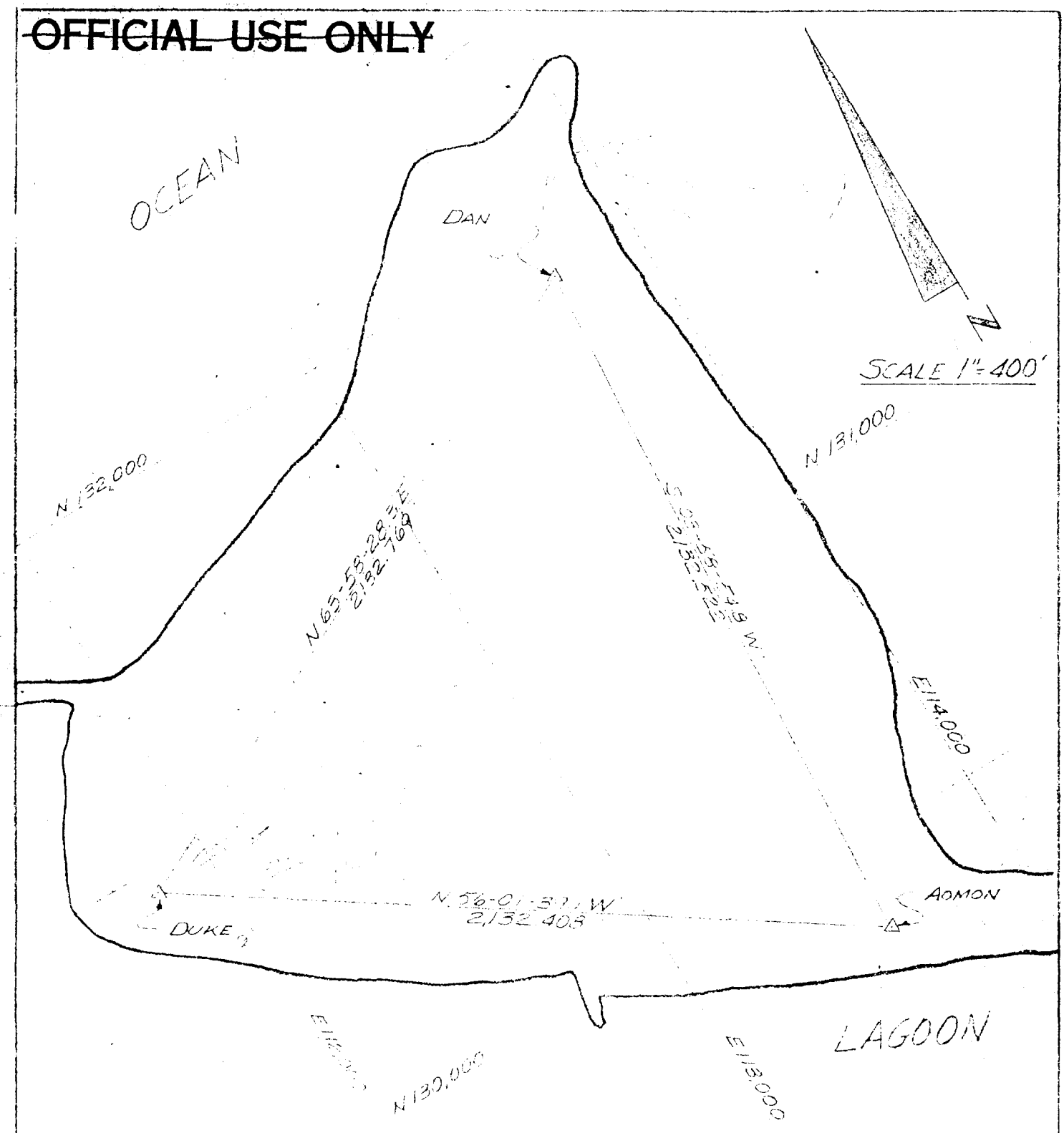
~~OFFICIAL USE ONLY~~



DATE		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED J.C.	SITE PEARL

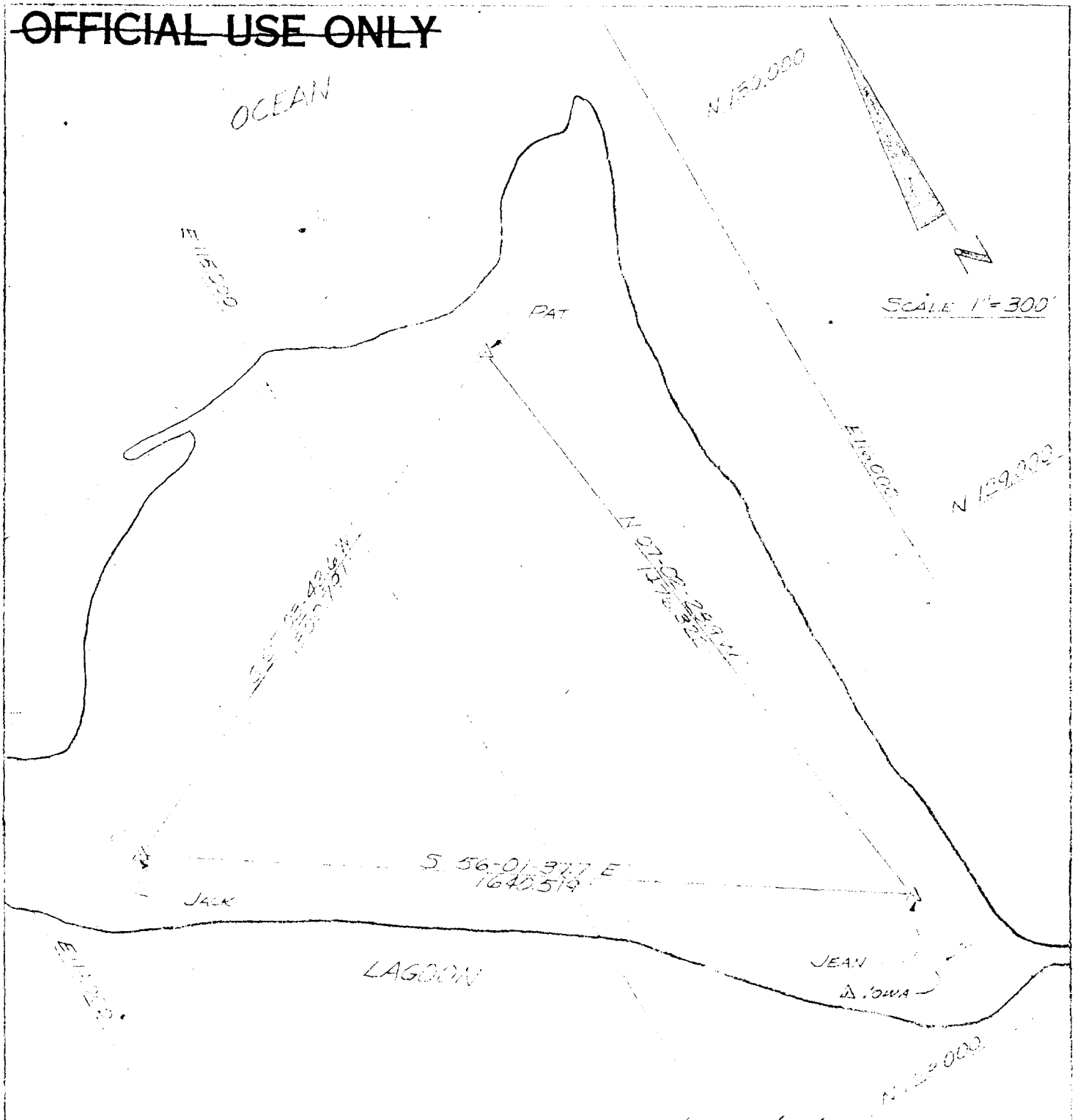
~~OFFICIAL USE ONLY~~

4E (41)



DUKE	N 130,993.079 E 117,[illegible]	ELEV. 6.10
DAN	N 131,[illegible] E 118,722.[illegible]	ELEV. 18.40
AOMON	N 12[illegible] E 119,[illegible]	ELEV.

DATE 4-14-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED J.D.	SITE SALLY



IONA N 128,206.44
E 118,655.09

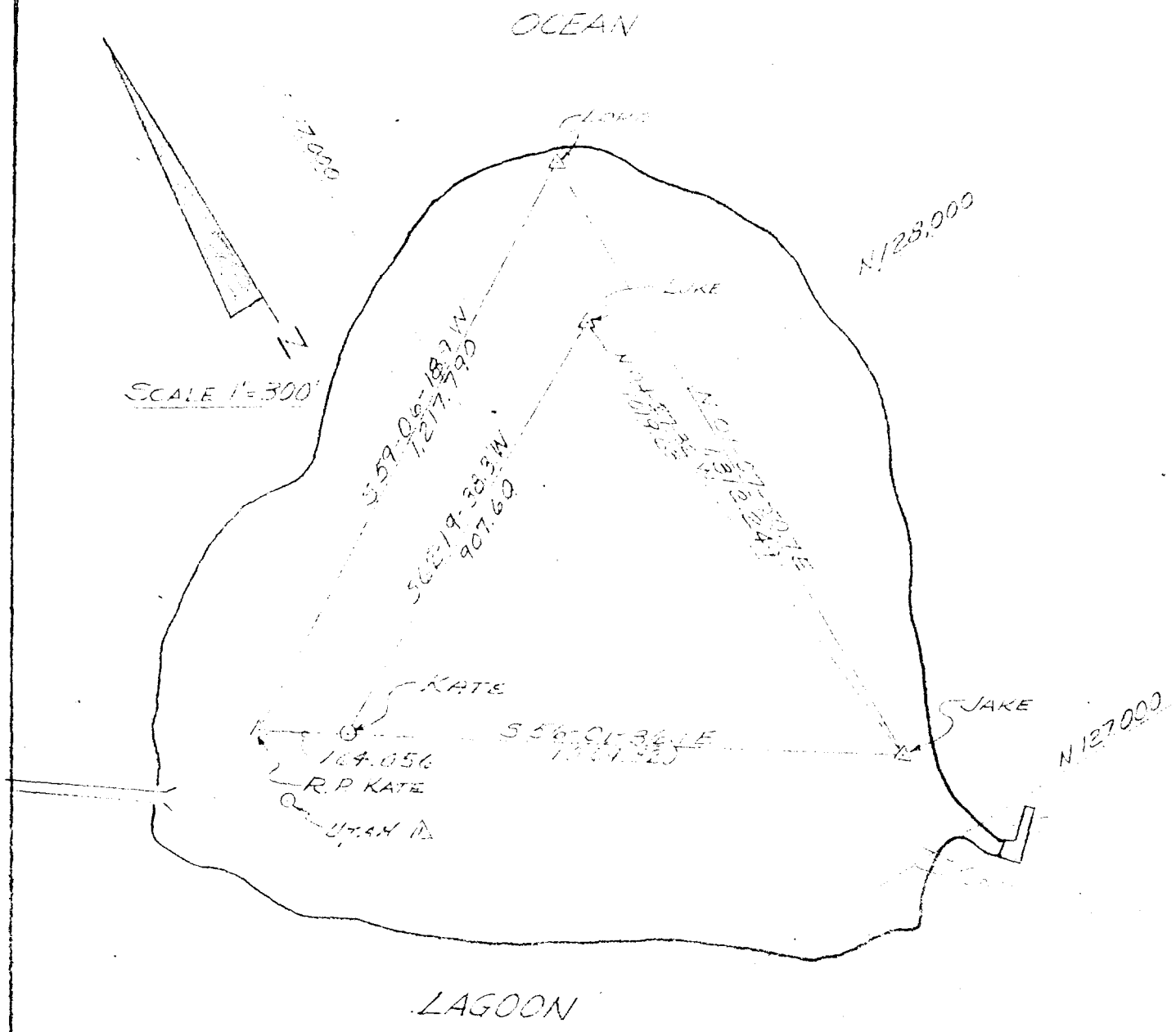
JACK N 128,[illegible] E [illegible] 7.15'
E 118,[illegible]

PAT N 129,23[illegible].65
E 119,[illegible]

JEAN N 128,[illegible] E [illegible] 8.23'
E 118,[illegible]

△ TO DATE 11-30-55 MM

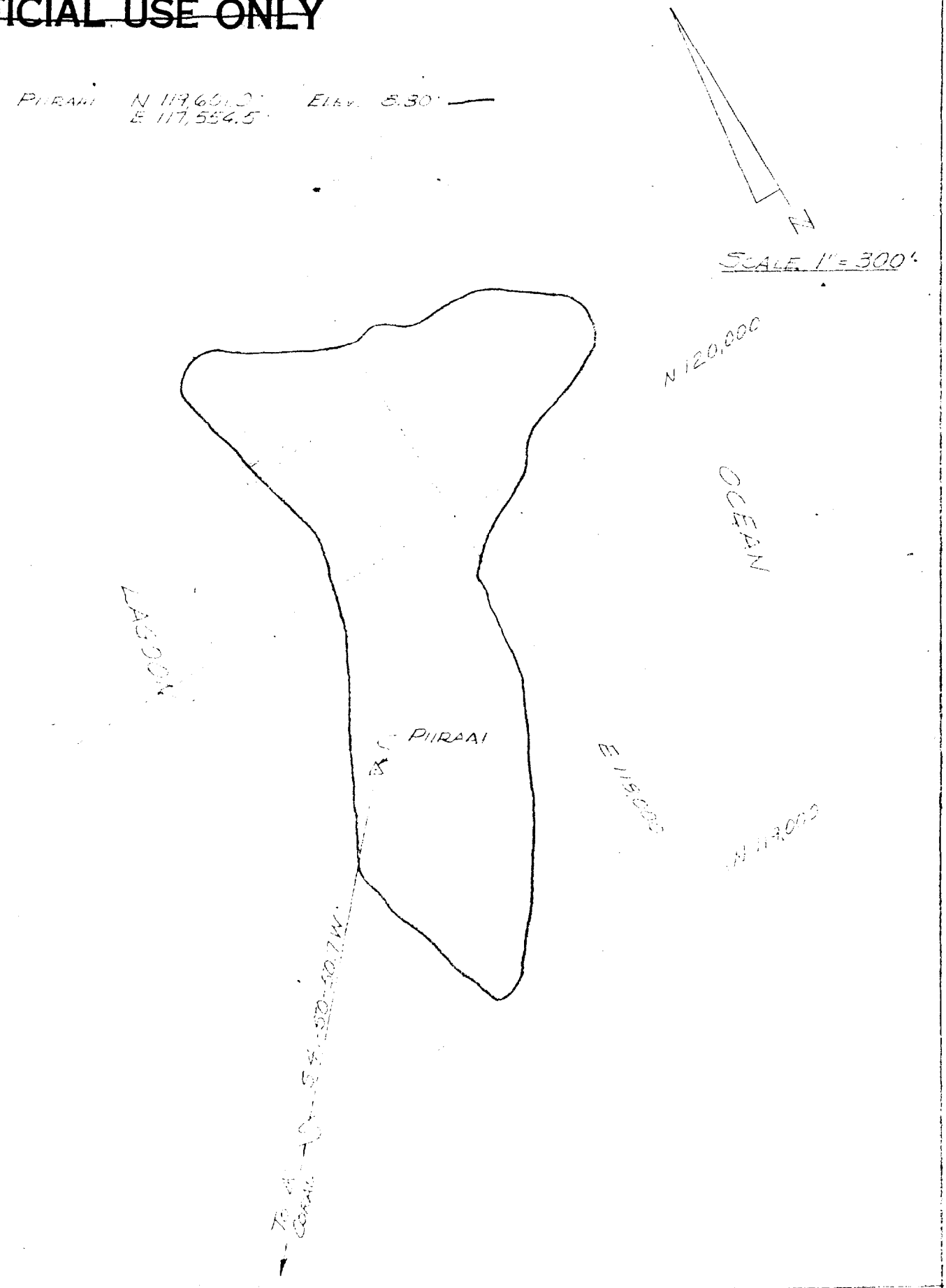
DATE 4-11-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED [illegible]	SITE TWO A



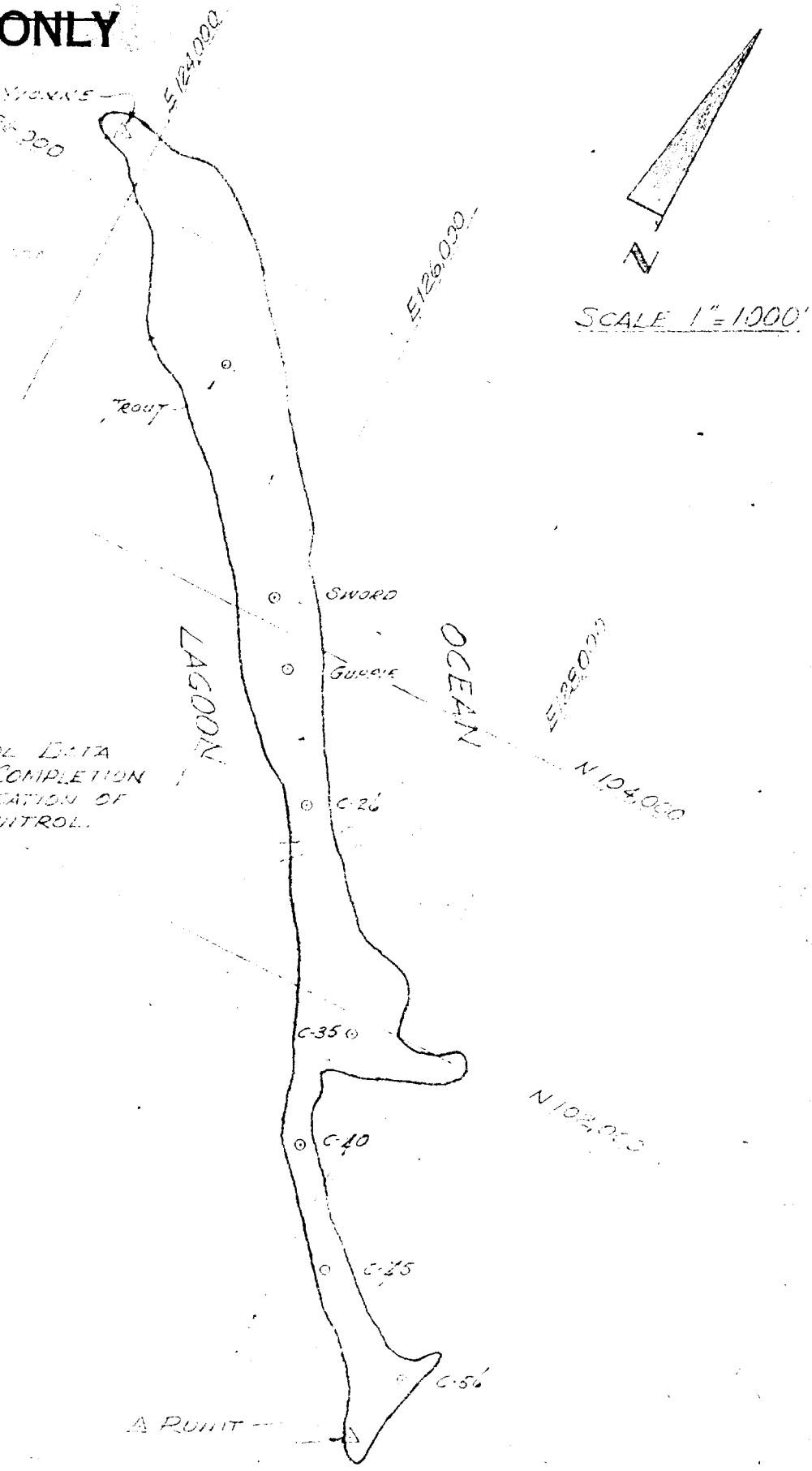
UTAH	N 127,735.53 E 116,320.92	
KATE	N 127,795.22 E 116,483.29	
R.P. KATE	N 127,976.873 E 116,347.229	ELEV. 8.33
JAKE	N 127,190.193 E 117,366.343	
LORD	N 128,502.152 E 117,542.237	
LAKE	N 125,206.73' E 117,251.07'	ELEV. 10.24

	DATE 4-20-54		GENERAL CONTRD. LAYOUT
	DRAWN ES	CHECKED JD	SITE URSULA

D. TO DATE 11-30-55 JM



DATE 4-19-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED J.J.	SITE WILMA



NOTE:
ADDITIONAL CONTROL DATA TO BE ADDED UPON COMPLETION OF RECOVERY & VERIFICATION OF VALUES OF EXISTING CONTROL.

YVONNE	N	106354.60
	E	123753.00
TROUT	N	105363.51
	E	125042.89
SWORD	N	104,154.87
	E	126,000.28
GUPPIE	N	103,206.69
	E	126,245.91
C-26	N	103,651.85
	E	126,798.58
C-35	N	101,701.65
	E	127,777.43
C-40	N	101,120.14
	E	128,179.65
C-45	N	100,488.98
	E	128,253.05
C-56	N	100,055.55
	E	129,036.52
RUNIT	N	99,585.20
	E	129,837.51

DATE		GENERAL CONTROL LAYOUT
4-19-54		SITE YVONNE
DRAWN	CHECKED	
ES	J.O.	

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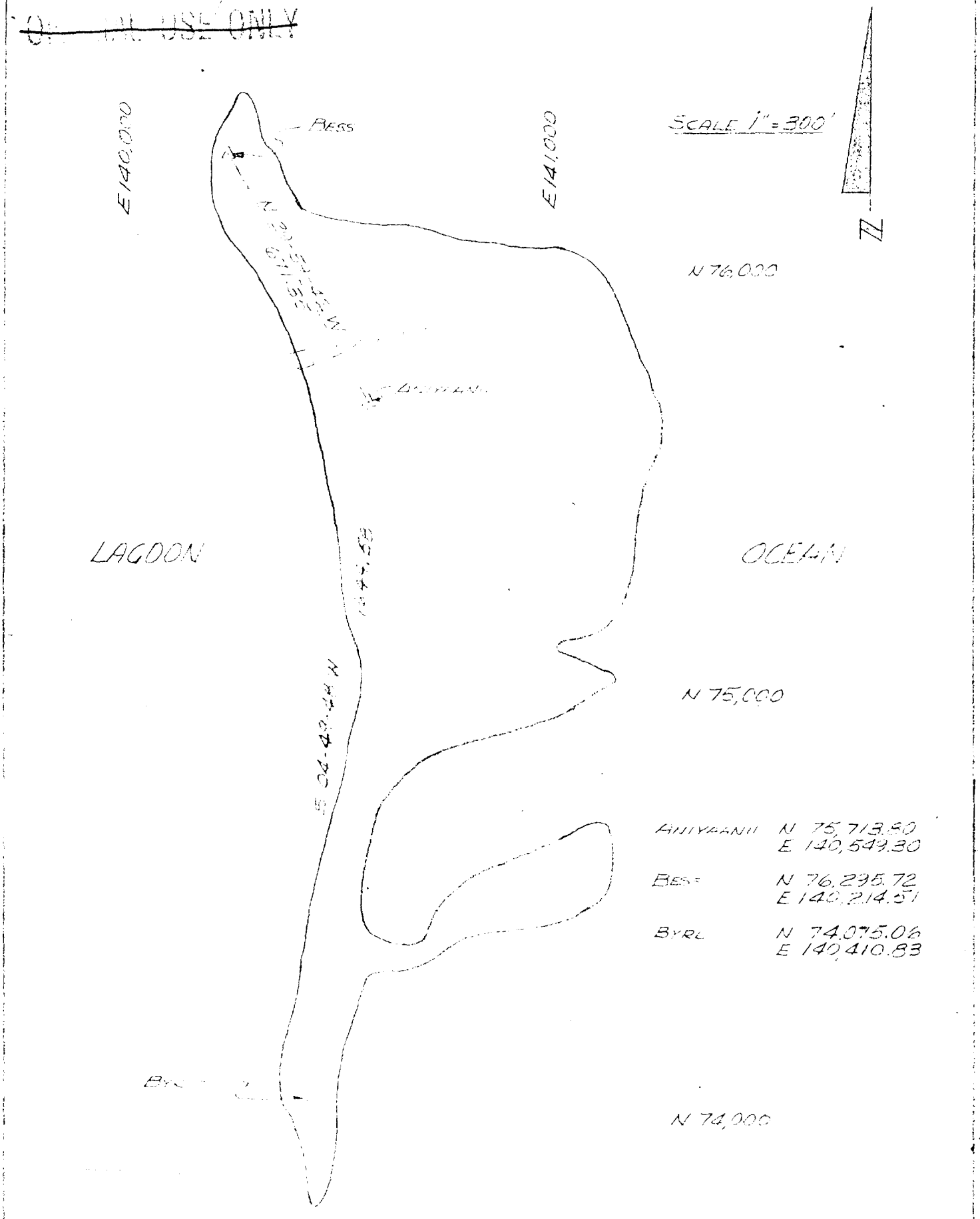

DATE 8-4-80		GENERAL CONTROL LAYOUT SITE BRUCE
DRAWN ES	CHECKED NCA	

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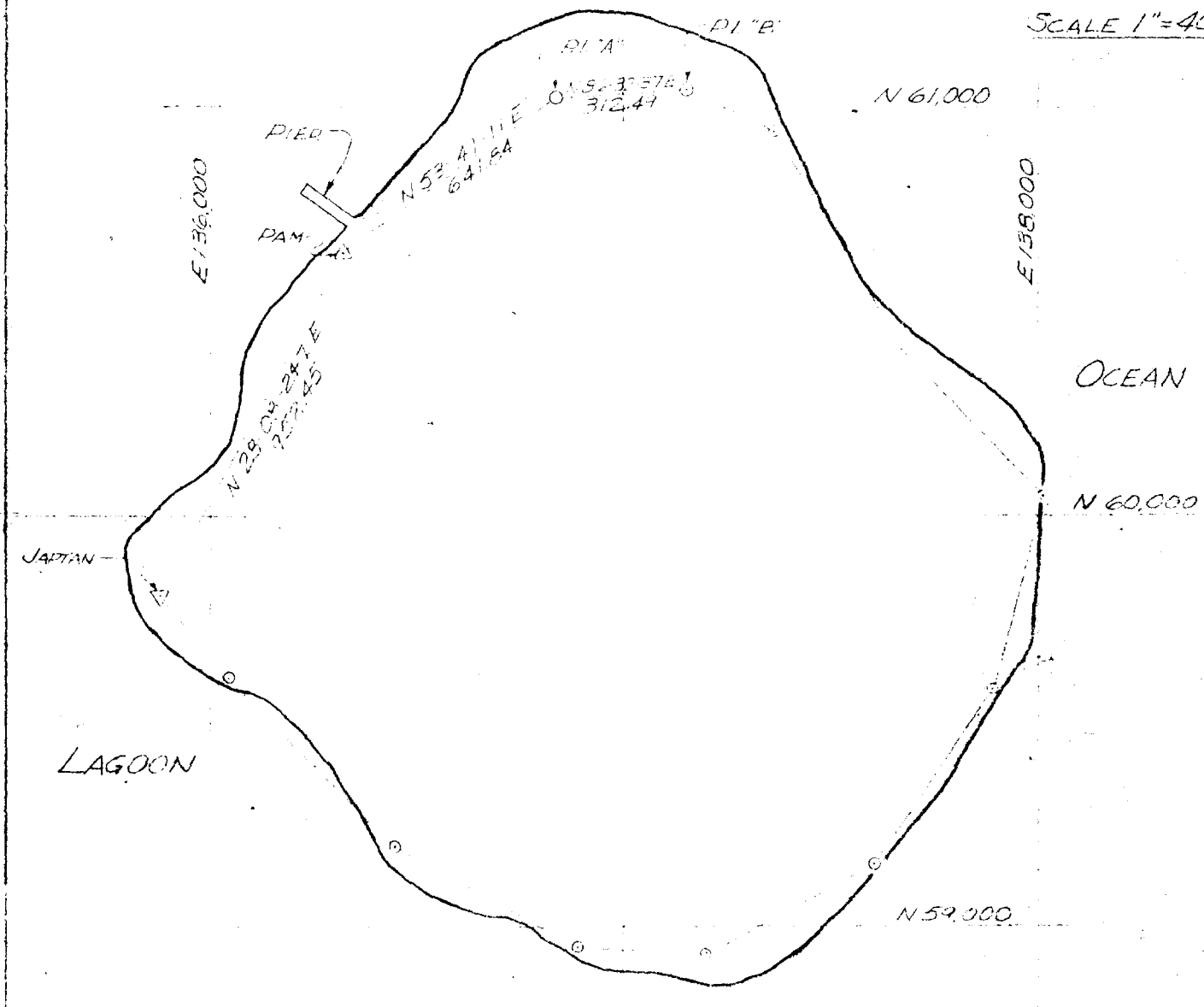
~~OFFICIAL USE ONLY~~

JAPTAN N 59,804.90 E 135,674.90

PAM N 60,044.67 ELEV. 9.41 E 136,324.15

PI "A" N 61,024.52 ELEV. 10.11 E 136,541.62

PI "B" N 61,043.16 ELEV. 11.09 E 137,159.54



NOTE:

PI'S A & B ARE MONUMENTED.

DATE 4-26-54	GENERAL CONTROL LAYOUT
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~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~

SITE FRED

BUILDING & STRUCTURE NUMBERS

HOLMES & NARVER, INC.

REVISED TO 1 OCT. 1956

MISC. 415

NOTE: Any corrections or changes to this list should be made only on the master list which is maintained in the Office Engineering & Design Department of the Engineering Division

54

GENERAL NOTES

1. For further information on sizes and types of buildings, refer to the As-Built Drawings.

*2. Column denoted by an asterisk contains numbers which represent General Layout Drawing Number or area on which building appears on the new 1" - 50' topographic sheets.

3. The building numbers in this index pertain to Holmes & Narver Plans, General Layouts and Survey notes.

4. Symbol beside building number (M) indicates Military owned building or structure.

5. Symbol beside building number (C) indicates A.E.C. owned building or structure that is capitalized, or, Construction-Work-Is-In-Progress.

SITE FRED

BLDG. NO.	SIZE	USE	TYPE	#
1 - M	96'x115'	E.M. Recreation (Navy)	Wood & Corr. Metal, "T" Shape	1
1A - M	12'x12'	Latrine	Wood	1
2 - M	20'x68'	Officers Beach Club	"L" shape, wood & Corr. Transite	1
	20'x28'		Wood & Corr. Transite	
3 - C	24'x24'	Transmitter (Power)	Prefabricated Aluminum	2
4 - C	24'x120'8½"	Receiver	Prefabricated Aluminum	2
4A- C	8½x8½'	Storage Shed	Wood Frame on 4x4 Wood Foundation	2
5 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
6 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
7 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
8 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
9 - C	8'x12'x6'8½"	Open Air Shower & Latrine	Canvas on Wood	6
10 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	3
11 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	3
12 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	3
13 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	3
14 - C	24'x24'8½"	Dispatcher Shack	Prefabricated Aluminum	5
15 - C	24'x172'8½"	Group HQ, "H" shape	Prefabricated Aluminum	3
	24'x148'8½"		Prefabricated Aluminum	3
	24'x31'8½"		Prefabricated Aluminum	3
15A - C		Assigned to Incinerator	Concrete & Brick	3
16 - C	24'x100'8½"	P.O., P.X. & B.S.	Prefabricated Aluminum	3
	2-24'x50'8½"	with 3 wings	Prefabricated Aluminum	3
	24'x28'8½"		Prefabricated Aluminum	3
	24'x24'8½"		Prefabricated Aluminum	3
17 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
18 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
19 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
20 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
21 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
22 - C	24'x68'8½"	Hospital Wards	Prefabricated Aluminum	3
23 - C	24'x68'8½"	Hospital Wards	Prefabricated Aluminum	3
24 - C	24'x138'8½"	Dispensary with 4 wings	Prefabricated Aluminum	3
	24'x94'8½"		Prefabricated Aluminum	3
	2-24'x54'8½"		Prefabricated Aluminum	3
	9'7"x14'	Lean-to Addition	Wood	3
	9'7"x10'10"	Lean-to Addition	Wood	3
25	22'0"x44'0"	Boathouse	Wood Frame	1
26 - M	38'6"x46'	AtCom Residence	Wood	3
27 - M	59'x87'7"	Officers Club	Wood	3
28 - M	7x17'	Ammo Storage	2 Steel cubes with corrugated metal top	3
29 - C	24'x60'8½"	Fire Station	Prefabricated Aluminum	3
30 - C	800 Man	Open Air Theater	Wood Proj. booth seats, and transite screen	3
31 - C	24'x148'8½"	Laundry	Prefabricated Aluminum	3
	24'x26'8½"			
	24'x84'8½"			
31A	10'x12'	Laundry Wrapping Paper Storage	Wood Shed - No Foundation	3
32		Chapel, shape of Cross	(Demolished)	
33 - C	24'x236'8½"	Reefer Bank	Prefab. Aluminum, Elevated	3

BLDG. NO.	SIZE	USE	TYPE	*
34 - C	24'x44'8½"	Boiler House	Prefabricated Aluminum	3
35 - C	50'6"x76'8½"	Bakery	Prefabricated Aluminum	4
36 - C	50'6"x76'8½"	Mess Hall	Prefabricated Aluminum	3
	50'6"x259'2"	Mess Hall	Prefabricated Aluminum	3
	50'6"x54'8½"	Mess Hall	Prefabricated Aluminum	3
	50'6"x82'8½"	Mess Hall	Prefabricated Aluminum	3
	2-24'x22'8½"	Scullery	Prefabricated Aluminum	3
	24'x22'8½"	Heater Rm & Dry Storage	Prefabricated Aluminum	3
	8'6"x10'	Garbage	Wood	3
	16'x12'6"	Pot Washing	Wood	3
	24'x45'10½"	Storage Supply	Prefabricated Aluminum	3
	24'x24'8½"	Butcher Shop	Prefabricated Aluminum	3
36A	18'x70'	Reefer Shelter	Wood	3
37 - C	24'x173'8½"	Commissary W/6 reefers	Prefabricated Aluminum	4
38 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
39 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
40 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
41 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
42 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
43 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
44 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
45 -				-
46 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
47 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
48 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
49 -	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
50 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
51 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
52 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
53 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
54 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	5
55 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	5
56 - C	51'8"x136'8½"	Power & Dist. Plant	Prefabricated Aluminum, Elevated	5
56A-C	33'10"x55'	Badger Shed	Wood & Corr Aluminum	5
56B -	10'2"x10'4"	Pump House	Corr. Aluminum	5
57 - C	24'x12'8½"	Laboratory	Prefabricated Aluminum	6
58 - M		Ordnance Warehouse	(Demolished)	
59 - M	40'x100'	Ordnance Warehouse	Jumbo Quonset	8
60 - M	40'x100'	General Whse.	Jumbo Quonset	8
61 - M	40'x100'	Gear Loft	Jumbo Quonset	7
62 - M	40'x100'	Salvage Warehouse	Jumbo Quonset	8
63 - M		Special Service Whse	(Demolished)	
64 - M		Ordnance Shop	(Demolished)	
65 - M		Q.M. Supply	(Demolished)	
66 - M	40'x100'	Q.M. Sales & Stores	Jumbo Quonset	7
67 - M	40'x100'	Q.M. Expendable Whse	Jumbo Quonset	7
68 - M	70'x81'	Reefer Bank and Packing and Crating Bldg.	[illegible] (Demolished)	
69 - M		Warehouse	(Demolished)	
70				-
71 - M	40'x100'	Warehouse	Jumbo Quonset	7
72 -	20'x60'	Square & Compass Club	2-Story Quonset	7
73 - M	40'x100'	Army Engineer Whse.	Jumbo Quonset	7

BLDG. NO.	SIZE	USE	TYPE	*
74 - M	40'x100'	P.X. Warehouse	Jumbo Quonset	7
75 - M	40'x100'	H & N Warehouse	Jumbo Quonset	7
76 - M	40'x100'	Army Supply Whse	Jumbo Quonset	7
77 - C	24'x80'8½"	Drone H.[illegible]	Corr. Prefab. Aluminum	13
78 - M	21'x21'	Aircraft Decontamination Office	Plywood	15
79 - M	40'x100'	Electronic Control	Jumbo Quonset	13
80 - M	40'x196'	Bulk Storage	Jumbo Quonset	13
81	15'x15'	Tower	Wood w/concrete piers	16
82 - M	80'x100'	Aircraft Maintenance Shop	(2) Butler Type	12
83 - M		Signal Corps Whse.	Demolished	
84		Transmitter (Power)	Demolished	
85 - C	24'x56'8½"	Receiver	Prefabricated Aluminum	12
86				
87 - C	10'7½"x10'7½"	Hydrogen Storage	Wood and Aluminum	18
88 - C	15'x15'	Weather Station	Wood and Aluminum	18
89 - C	24'x96'8½"	Base Operations "U"	Prefabricated Aluminum	16
	24'x78'8½"	Shops	Prefabricated Aluminum	16
	23'7½"x23'7½"	Tower	Wood and Aluminum	16
	24'x72'8½"	Terminal Whse	Prefabricated Aluminum	16
90 - C	(24'x2"x144'8½"	Air Force Task Gp HQ	Prefabricated Aluminum	16
	(3-24'x50'8½"	"E" shape W/Add N End	Prefabricated Aluminum	16
90C - M	20'x94'	Office & Storage	Wood	16
90G - M	30'x40'	Emergency Power Plant	Wood	16
91 - C	24'x20'8½"	Alert Crew Office	Pacific Iron & Steel Bldg.	16
91A	57'x22'	Crash Truck Shelter	Wood	16
92 - C	24'x32'8½"	L-13 Operations	Prefabricated Aluminum	16
93 - C	50'x60'	L-13 Maintenance	Steel & Aluminum	14
94 - C	24'x48'8½"	POL Pump House	Prefabricated Aluminum	12
95 - C	4-1000 Bbl	Storage 100 Oct AvGas	Tank-Steel Bolted, Vertical (T-33-36 incl.)	1
95A - C	1-1000 Bbl	Storage, MoGas	Tank-Steel Bolted, Vertical (T-28)	12
	4-10,000 Gal.	Storage, 91 Oct AvGas	Tank-Steel Bolted, Horizontal (T-29-30)	12
96 - C	2-1000 Bbl	Storage, JP1, Fuel	Tank-Steel Bolted, Vertical (T37 & T43)	12
96A - C	4-10,000 Gal.	Storage, Diesel Fuel	Tank-Steel Bolted, Horizontal (T39-42)	12
	1-1000 Bbl.	Storage, Diesel	Tank-Steel Bolted, Vertical (T-38)	12
97 - M		AACS Supply Whse. and Radio Maintenance	(Demolished)	
98 - M		Warehouse	Demolished	
99 - M	20'x56'	Warehouse	Quonset	13
100 - M		Warehouse	Demolished	
101 - M		Warehouse	Demolished	
102 - M		Warehouse	Demolished	
103 - M		Warehouse	Demolished	
104 - M		Warehouse	Demolished	
105 - M		Warehouse	Demolished	
106 - M		Warehouse	Demolished	
107 - M	2-1000 Bbl	Storage, Fresh Water	2-Tanks, Steel, Bolted, Vertical	
107 - C	3-1000 Bbl	Storage, Fresh Water	3-Redwood Stave, Vertical	
108 - C	712 Man	Open Air Theater	Proj. Booth, Stage & Seats Wood	5
			Screen Transite	4
109 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
110 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
111 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
112 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
113 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4

BLDG. NO.	SIZE	USE	TYPE	*
11 - M	12'x15'	Generator Shed	Wood & Plywood	9
115 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	5
116 - M	24'x100'8½"	Loran	Prefabricated Aluminum	1
116A - M		Loran Annex	(Demolished)	
117A - C	24'x20'8½"	NRDL	Prefabricated Aluminum	6
117B - C	24'x12'8½"	NRDL	Prefabricated Aluminum	6
117C - C	15'10"x31'10"	NRDL	Tent on Concrete Slab	6
117D - C	14'x2"x14'4"	NRDL	Tent on Concrete Slab	6
117E - C	15'10"x31'10"	NRDL	Tent on Concrete Slab	6
117F - C	32'x8'	NRDL	Shelter Wood	6
117G	20'x24'	NRDL	Quonset	6
117H	15'10"x31'10"	NRDL	Tent on Concrete Slab	6
117I	15'10"x31'10"	NRDL	Tent on Concrete Slab	6
118 - M	195'x198'	B-50 Hanger	Steel & Galv. Iron	12
119 - M	45'x20'	Petroleum Products Supply	Concrete Slab	7
120 - C	40' x 130'	M-Boat Ramp	Concrete	1
121 - C	27'x52'	Elevated Water Storage	Timber Tower W/1-1000 bbl and 1-500 bbl tank	3
122 - C	24'x36'8½"	Latrine & Shower	Prefabricated Aluminum	4
123 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
124 - C	24'x32'8½"	Salt Water Pump Station	Prefabricated Aluminum	2
125 - C	24'x20'8½"	Latrine & Decontamination Shower	Prefabricated Aluminum	15
126 - C	12' x 12'	Latrine	Wood and Corr. Metal	12
127 - C	24'x20'8½"	Latrine	Prefabricated Aluminum	12
128 C	12'x12'	Latrine	Wood and Corr. Metal	7
129		Latrine	(Demolished)	
130 - C	24'x20'8½"	Latrine	Prefabricated Aluminum	13
131 - C	13'x16'	Booster Pump House	Wood and Aluminum	12
132 - C	4'x4'	Sentry Post	Concrete Slab	6
133	20'x48'	Weather Station	Concrete Slab w/8 Man Tent	18
134 - M		Signal Corps Repair	Quonset (Demolished)	
135 - M		Auxiliary Equip. Storage	2-Story [illegible] (Demolished)	
136 - M			Slab	3
137 - M		Magazine	[illegible] (Demolished)	
138 - M	20'x80'	AF Auxiliary Power	Galv. Iron Shelter	12
139	20'x48'	Weather Station	Concrete Slab w/8 Man Tent	18
140 - C	59'x64'	Cargo Pier W/Approach Dock 20'x35'3"	Timber Construction	12
141	5'x20'	Storage Sheds	3-Sided Wood Shelters	1
142 - C	16'x80'	Personnel Pier	Wood on Wood Piling	1
143 - M	20'x20'	AACS Emergency Power	Wood	16
144 - M	22'x4"x44'4"	Ice Plant	Wood Shelter	3
145	14'x20'x15'	Assigned to Hydrogen Generating Bldg.	Wood, Sheet Metal	18
146 - M		Hut	(Demolished)	
147 - M		Base Flight Maintenance	(Demolished)	
148 - M	13'x13'	Inflation Shelter	Wood	18
149 - M	12'x24'	Shower	4 Man Tent on Larger Slab	18
149A -	4'x4'	Latrine	Wood on Concrete Slab	18
150 - M		AACS UC Storage	[illegible] Slab	
151 M		AACS UC Storage	Quonset (Demolished)	
152	8'x16'	Storage Shed	Wood w/Dirt Floor	18
153 - M	20'x25'	Navy Boat Supply	Quonset	12
154 - M	16'x16'x75'	Navigation Tower	Steel	12
155 - M	20'x62'	Small Boat Repair	Quonset	13

BLDG. NO.	SIZE	USE	TYPE	
156 M		HQ, HQ, Squadron	Demolished)	
157 M		Warehouse	(Demolished)	
158 - M	30'x34'	Vehicle Wash Stand	Concrete	13
158A - M	10'x12'	Wash Rack Utility Room	Metal	13
159 - M		Warehouse	(Demolished)	
160 - M		Warehouse	(Demolished)	
161 - M			Slab	13
162 - M	20'x44'	Warehouse	Quonset	9
163 - M	20'x30'	Warehouse	Quonset	9
164		Garbage Ramp	Concrete	17
165 - M	20'x50'	Magazine	Corr. Metal, Earth Covered	15
166 -			Slab	-
167 - M	20'x32'	Utility Operation	Quonset	7
168		Pershing Field, Parade Ground		3
169 - M	20'x36'	H.& N. Maint. Office	Quonset	7
170 - M		Office	(Demolished)	
171		Radar Tower	(Demolished)	
172 - M	8'x12'	Pier Office	Wood	22
173 - M		Dump Master's Shack	Wood (Demolished)	
174 - M	8'x8'x8'	Weather Radar Tower	Wood	16
175 - M	20'x30'	H.& N. Inspector's Off.	Plywood and Metal	7
176	52'x98'	Basketball Court		3
177	30'x80'	Handball Court		3
178				-
179				-
180		Grease Rack	(Demolished)	
181		Truck Loading Rack Sve Station	(Demolished)	
182		Service Station	(Demolished)	
183		Grease Rack	(Demolished)	
184		Acid Tank Building	Wood (Demolished)	
185 -M	12'x12'	Latrine	Wood	14
186 - C	24'x20'8½"	Pump House	Prefabricated Aluminum	5
187 - M				-
188 - M		Monitor Units	(Demolished)	
189 - M		Monitor Units	(Demolished)	
190 - M	8'x12'	Telephone Terminal Building	Wood	16
191 - M		JATO STOR. IGLOO		-
192		Storage	Demolished)	
193 - M		Shed	(Demolished)	
194				-
195				-
196				-
197				-
198				-
199				-
200				-
201-211	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	2
212-217				
218-270	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	2
271-275				
276-280	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	2
281-286				
287-	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	2
293-298				
299-304	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	3
305-310				

BLDG. NO.	SIZE	USE	TYPE	* -
31 16	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	3
317-328				
329-332	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
333-338				
339-342	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
343-348				
349-363	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
364-367				
368-377	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
378-422	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
423-471	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	5
472-476	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	5
477-478	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	5
479-480	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
481-482	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
483	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
484	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
485	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
486	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
487	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
488	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
489	14'x15'	Quarters, 4 Man Tents	Tent on Concrete Slab	5
490	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	9
491	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	12
492	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	12
49[illegible]	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	12

BLDG. NO.	SIZE	USE	TYPE	-
494				
495	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	11
496	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	11
49	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	14
498	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	15
499	20'x24'	Living Quarters	Wood on Concrete Blocks	4
500 - M	53'6"x20'	General Officer Qtrs	"L" shape Wood	3
501 - M	6'x6'	Assigned to Pumphouse (Motor Pool)	Wood	6
502 - M	38'x16'	H.Q. & H.Q. Detachment	Wood	3
502A-		Photo Lab	(Demolished)	
503 - M	126'6"x25'	Motor Pool Repair Shop	Wood and Galv. Metal	6
504 - M	24'x115'	Swimmers Tavern	"L" shape wood & Corr. Transite	
			Corr. Transite & Wood	2
505 - M	66'x32'9"	Duffy's Tavern	Wood	4
505A		Latrine	(Demolished)	
506 - M	48'8"x88'6"	NCO Club	Corr. Transite & Wood	4
506A	10'x18'	Reefer Shelters	Wood Frame - Plywood Siding	4
507 - M			Slab	3
507A - M	48'x20'	Hobby Shop	Wood	3
508 - M	18'x42'	Store Room	Wood Frame Corrugated Metal Siding	3
509 - M	20'x87'	Furniture Repair	Wood	5
510 - M	5'x5'	Telephone Terminal	Metal Cube	12
511 - C	12'x16'	Office	Wood and Aluminum	5
512 - M	12'x12'	Equipment Storage	Wood Frame-Corrugated Metal Cover	7
513 - M	16'x16'	Fire Dept. Stor. Shed	Corr. Metal & Wood	5
514 - M		Woods Athletic Field		5
515 - M	17'8"x48'	Engr. Maint. Office	Wood & Metal	4
516 - M	14'10"x24'10"	Storage for 50 Gal. Drums	2 Concrete Slabs	15
517 M	18'x31'	POL Office	Wood and Transite	12
518 - M	14'10"x24'10"	Storage for 50 Gal Drums	Concrete Slab	15
519 - M	16'x20'	Engineers Paint Shop	Corr. Metal & Screen	7
520 - M	24'8"x10'7" 8'3"x8'7"	Motor Pool Shop Office	Wood, "L" Shape	6
520A - M		Service Station	Wood Bldg. & Gas Pumps	6
521 - M		Grease Rack	Wood	6
522 - M		Skeet Range		15
523 - M	16'x32'	Army Sec. Monitoring U.	Tent	5
524 - M	16'x32'	Army Sec. Monitoring U.	Tent	5
525 - M	16'x32'	Army Sec. Monitoring U.	Tent	5
526 - M	22'x64'	P.X. Warehouse	Prefabricated Aluminum	5
527 - M	12'x24' & 14'x18'	Heavy Equipment Shacks	Wood	5
528 - M	8'x12'	Storage Shed	Wood	6
529 - M	18'x45'	Motor Pool Office	Wood,Wood Flr, No Fndn,Corr.Metal Roof	6
530 - M	16'x35'	Ammo Storage	Quonset	7
531 - M	15'x30'	Sand Blast Shed	Wood & Corrugaged Metal	7
532 - M	8'x12'	Sand Blast Shed	Wood & Corrugated Metal	7
533 - M	8'x8'	Sand Blast Shed	Wood & Corrugated Metal	7
534 - M	25'x25'		Slab	8
535 - M	8'x10'	Ordinance Inspection	Wood	8
536 - M	20'x85'	Engineer Supply Storage	Wood Frame - Canvas Covered	7
537 - M	12'x12'	Office	Wood Frame-Corrugated Metal Cover	7
538 - M	8'x16'	Office	Metal	13
539 - M	12'x16' & 20'x24'	Shed	Metal	13
540 - M	18'x20'	Pump House	Wood w/Metal Roof	13
540A M	12'x12'	Water Tower	Cube on Wood Tower	13

BLDG. NO.	SIZE	USE	TYPE	
541 - M	12'x18'	Shed	Wood Frame - Canvas Cover	13
542 - M	6'x10'	Storage Shed	Wood w/concrete floor	13
54 M	15'x20'	Paint Storage	Metal	12
544	24'x120'	Reefer Shelter	Wood on Elevated Fdn.-Metal Roof	4
545		Generator Shed	Wood with metal roof (Demolished)	
546	12'x20'	Hot Locker Bldg.	Wood Frame w/corrugated metal	4
547	12'x15'	Barber Shop	Wood on Wood Blocks	4
548 - M	8'x16'	Air Force Mail Room	Wood Frame - Corrugated Metal covered	4
549 - M	24'x26'	Air Force Gym	Wood & Corr. Metal, Wood Floor	4
550				
551 - M	16'x34'	Storage	Wood & Corrugated Metal	12
552	8'x32'	Tool Shed	Wood & Corr. Metal on Skids	12
553	20'x25'		Concrete Slab	14
554	15'x25'	Sand Blast Pad	2 Sided Wood Wall - Metal Roof	15
555	12'x12'		Slab	15
556	200'x300'	Jet Warm Up Pad	Concrete Slab	13
557	135'x260'	Decontamination Pad	Concrete Slab	15
558	100'x150'	Decontamination Pad	Concrete Slab	15
559	32'x50'	Jet Deflector Pad	Concrete Pad	15
560				-
561 - C	5000 bbl	Storage Av-Gas	Tank, Steel, Welded, Vertical (T-1)	12
562 - C	5000 bbl	Storage, Jet Fuel	Tank, Steel, Welded, Vertical (T-2)	12
563 - C	10,000 bbl	Storage, Av. Gas	Tank, Steel, Welded, Vertical (T-3)	12
564 - C	10,000 bbl	Storage, Jet Fuel	Tank, Steel, Welded, Vertical (T-4)	12
565				-
566				-
567				-
56				
569 - C		Av-Gas Fill Stand	Steel Platform - Concrete Pad	15
570 - C		Av-Gas Fill Stand	Steel Platform - Concrete Pad	15
571 - C		Mo-Gas Fill Stand	Steel Platform - Concrete Pad	12
572		F. W. Tank		15
573				-
574				-
575				-
576				-
577				-
578				-
579				-
580				-
581				-
582				-
583				-
584				-
585				-
586				-
587				-
588				-
589				-
590				-
591				-
592				-
593				-
594				-
595				-
596				-
597				-

BLDG NO.	SIZE	USE	TYPE	*
59				-
59				-
600 - C	80'x120'	Warehouse	(2) Butler Type	13
601 -				
602 - C	40'x120'	Warehouse	Prefabricated Steel	7
603 - C	51'x102'	Special Services	Prefabricated Aluminum	3
	51'x128'	In "L" Shape	Prefabricated Aluminum	3
604 - M	20'x48'	Electronics Maintenance	Prefabricated Steel	12
605 - M	20'x48'	Electronics Maintenance	Prefabricated Steel	12
606 - M	20'x48'	Tech. Supply & Inspect.	Wood	12
607 - M	20'x48'	Air Weather Service	Prefabricated Steel	9
608 - M	20'x48'	Air Weather Service	Prefabricated Steel	9
609 - M	20'x48'	Air Weather Service	Prefabricated Steel	9
610 - M	20'x48'	Photo Laboratory	Prefabricated Steel	12
611 - M	20'x48'	Line Maintenance	Wood	12
612 - M	20'x48'	Supply	Prefabricated Steel	9
613 - M	20'x48'	Supply	Prefabricated Steel	9
614 - M	20'x48'	Depot Supply	Prefabricated Steel	7
615 - M	20'x48'	Depot Supply	Prefabricated Steel	7
616 - M	20'x48'	Mess Hall Storage	Prefabricated Steel	4
617 - M		Gear Loft	(Demolished)	
618 - M	20'x48'	AG Office	Prefabricated Steel	3
619 - M	20'x48'	Special Ser. Whse.	Prefabricated Steel	3
620 - M	20'x48'	Ordnance Maintenance	Prefabricated Steel	8
621 -	16'x16'	Radar Tower	Steel	16
622 - M	20'x48'		Slab	8
623			(Demolished)	10
624 - M	7'x32'	Storage	Wood	9
625 - M	20'x100'		Slab	9
626 - M	40'x40'		Slab	9
627 - M	20'x35'		Slab	9
628 - C	10x13'x8'	25-Man Latrine	Wood	14
629 -	20'x20'8½"	Storm Detection Radar	Pacific Bldg. (Esp. Const.)	16
630 - M	20'x72'	Parachute Repack Bldg.	Prefabricated Steel	12
631 - M	24'x20'	Carpenter Shop	Prefabricated Steel	12
632 - M	20'x48'	WRECEP Personal Equipment (A.F. Whse.)	Wood	9
633 - M	20'x48'	Aircraft Parts	Wood	12
634 - M	20'x48'	Navy Operations	Wood	14
635 - M	20'x48'	Navy Operations	Wood	14
636 - M	20'x48'	Navy Operations	Wood	14
637 - M	20'x48'	AF Personal Gear Storage	Wood	13
638 - M	12-20'x48'	Supply Warehouse	Wood	9
639 - M	16'x16'x35'	Parachute Drying Tower and Boiler House	Wood	12
640 - M	20'x48'	A.E.C. Warehouse	Prefabricated Steel	12
641 - C	120'x120'	Q.M. Non-expendable Whse	Prefabricated Steel	7
642 - C	80'x120'	Ordnance Whse	Prefabricated Steel	8
643 - C	80'x120'	Q.M. Expendable Whse	Prefabricated Steel	7
644 - C	40'x120'	Q.M. Sales	Prefabridated Steel	7
645 - C	40'x101'x16'	T.C. Gear Loft & Security Storage		12
646 -	40'x101'	Aircraft Engine Bldg. & Storage	Prefabricated Steel	12
647 - C	24'x[illegible]'	M.P. Hdqtrs	Prefabricated Alum	4
648 - C	78'x120'	Warehouse (AF Supply)	Prefabricated Steel	13

64

~~OFFICIAL USE ONLY~~

BLDG. NO.	SIZE	USE	TYPE	*
649 - C	78'4"x120'	Warehouse (AF Supply)	Prefabricated Steel	13
650 - C	38'4"x120'	Warehouse (AF Supply)	Prefabricated Steel	13
651 - C	38'4"x100'	Equip. & Storage Bldg.	Prefabricated Steel	12
652 - M	20'x48'	Radio Station WXLE	Prefabricated Steel	3
653				-
654	24'x128'8½"	Assigned to 40-Man Bks.	Aluminum (Not built)	-
655				-
656				-
657				-
658	24'x128'8½"	Assigned to 40-Man Bks.	Aluminum (Not Built)	-
659	24'x128'8½"	Assigned to 40-Man Bks.	Aluminum (Not Built)	-
660 - M	20'4¼"x48'4¼"	RAWINSONDE	Prefab. Steel (Weather Detach.)	18
661 - C	25'2"x85'10½"	Eng. Equip. Bldg. & Main.Shop	Prefabricated Aluminum	5
662	24'x148'8½"	Assigned to 48-Man Barracks	Prefabricated Aluminum (Not Built)	-
663 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
664 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
665 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
666 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
667 - C	24'x148'8½"	44-Man Barracks w/latrine	Prefabricated Aluminum	3
668 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
669 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
670 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
671 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
672 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
673 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	5
674 - C	15'x20'	Welding Shed	Wood Frame - Conc. Floor	5
675 - M	24'x48'	C.G. Quarters & Storage	Prefabricated Aluminum	1
676 - C	46'x90'	Guest House	Wood Frame	3
677 - M	42'x100'	Swimming Pool	Concrete	1
678 - C	33'x80' L Shape 24'x33'	Chapel	Wood	3
679 - C	121'2"x161'2"	Operations & Admin.	Prefabricated Steel	12
680 - M	10'x12'	Pump House (Swimming Pool)		1
681 - C	19'x48'	Electronics & Com. Bldg.	Prefabricated Steel	12
682 - C	24'x72'	Consolid. Shop	Prefabricated Aluminum	8
683 - C	48'x100'	" "	Prefabricated Steel	7
684 - C	40'x120'	" "	Prefabricated Steel	8
685 - C	24'x38'7¼", 50'6"x72'	Crash Fire Sta.	Prefab. Aluminum P.I.&.E.	7
686 - M	48'x104'	T.G. 7.1 Lab. Bldg.	Prefabricated Steel	15
687 - M	48'x104'	T.G. 7.1 Admin. Bldg.	Prefabricated Steel	15
688		Assigned to T.G. 7.1 Bldg.	(Not built)	-
689				-
690				-
691				-
692				-

BLDG NO.	SIZE	USE	TYPE	*
700 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	15
701 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	15
702 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	16
703 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	16
704 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	88

SITE DAVID

BUILDING & STRUCTURE NUMBERS

HOLMES & NARVER, INC.

REVISED TO 1 OCT 1956

MISC. 427

NOTE: Any corrections or changes to this list should be made only on the master list which is maintained in the Office Engineering Design Department of the Engineering Division.

GENERAL NOTE:

1. For further information on [illegible] buildings refer to the Ac-B 1971 Inventory.

2. Where [illegible] on each level [illegible] refer to General Layout [illegible] Number of [illegible] on the [illegible]

3. The [illegible] Plans, Grid [illegible]

4. Typical [illegible] (X) [illegible] Building [illegible]

5. Typical [illegible] Building number (5) [illegible] Grid [illegible]

BLDG. NO.	SIZE	USE	TYPE
1			
2			
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Blg. No.	Size	Use	Type	
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64				
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66				
67				
68				
69				
70				
71				
72				
73				
74				
7[illegible]				
[illegible]				
77				
78				
79				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89 -	20'x26'	Generator House		2
90	7'x9'	[illegible]	Wood	2
91	7'x11'	Infirm	Wood	2
92	30'x30'	[illegible]	Wood & Corr. Metal Roof	2
93	8'x24'	[illegible]	Wood & Corr. Metal Roof	2
94	20'x20'	Infirm	Wood & Corr. Metal Roof	2
95	30'x60'	Bulkley Hall Annex		3
96	20'x60'	Bulkley Hall Annex		3
97	20'x11'6"	Jail	Wood	1
98	6'x6'	Oil House		2
99	8'x12'	Grease Pit		1
100 -		Fuel Tank (Fuel Oil)	Steel Tank	1

Item No.	Date	Unit	Title	
101 - 1	[illegible]	[illegible]	[illegible]	1
102 - 1	[illegible]	[illegible]	[illegible]	1
103 - 1	[illegible]	[illegible]	[illegible]	1
104		[illegible]	[illegible]	
105	[illegible]		[illegible]	1
106 - 1	[illegible]	[illegible]	[illegible]	1
107	[illegible]	[illegible]	[illegible]	1
108	[illegible]		[illegible]	1
109			[illegible]	
110 - 1	[illegible]	[illegible]		
			[illegible]	1
111			[illegible]	
112	[illegible]		[illegible]	1
113	[illegible]		[illegible]	1
114		Armed Forces	[illegible]	
115	[illegible]	Armed Forces	[illegible]	1
116		Armed Forces	[illegible]	
117		Armed Forces	[illegible]	
118		Armed Forces	[illegible]	
119	[illegible]	Armed Forces	[illegible]	1
120	[illegible]	Armed Forces	[illegible]	1
121	[illegible]	Armed Forces	[illegible]	1
122	[illegible]	Armed Forces	[illegible]	1
123	[illegible]	Armed Forces	[illegible]	1
124	[illegible]	Armed Forces	[illegible]	1
125	[illegible]	Armed Forces	[illegible]	1
126		Armed Forces	[illegible]	
127	[illegible]	Armed Forces	[illegible]	1
128	[illegible]	Armed Forces	[illegible]	1
129	[illegible]	Armed Forces	[illegible]	1
130	[illegible]	Armed Forces	[illegible]	1
131	[illegible]	Armed Forces	[illegible]	1
132	[illegible]	Armed Forces	[illegible]	1
133	[illegible]	Armed Forces	[illegible]	1
134	[illegible]	Armed Forces	[illegible]	1
135	[illegible]	Armed Forces	[illegible]	1
136	[illegible]	Armed Forces	[illegible]	1
137		Armed Forces	[illegible]	
138	[illegible]	Armed Forces	[illegible]	1
139	[illegible]	Armed Forces	[illegible]	1
140	[illegible]	Armed Forces	[illegible]	1
141	[illegible]	Armed Forces	[illegible]	1
142	[illegible]	Armed Forces	[illegible]	1
143	[illegible]	Armed Forces	[illegible]	1
144	[illegible]	Armed Forces	[illegible]	1
145	[illegible]	Armed Forces	[illegible]	1
146	[illegible]	[illegible]	[illegible]	1
147			[illegible]	
148			[illegible]	
1/	[illegible]	[illegible]	[illegible]	1

[illegible]	SIZE	USE	TYPE	
[illegible]	10'x15'		Concrete Slab	1
151	20'x20'		Concrete Slab	1
[illegible]	10'x30'		Concrete Slab	1
[illegible]	10'x20'		Concrete Slab	1
154	10'x30'		Concrete Slab	1
155			Demolished	
[illegible]			Demolished	
157	10'x20'	Shed	Wood	1
[illegible]			Demolished	
[illegible]	20'x30'		Concrete Slab	2
160	8'x8'	Concrete Slab [illegible]	Concrete Slab	1
161			Demolished	
162			Demolished	
163	10'x15'		Concrete Slab	1
[illegible]			Demolished	
[illegible]	20'x20'	Powder Magazine	Buried Quonset	3
[illegible]	20'x20'	Powder Magazine	Buried Quonset	3
[illegible]	20'x20'	Powder Magazine	Buried Quonset	3
	15'x15'		Concrete Slab	1
[illegible]	15'x37'		Concrete Slab	1
[illegible]			Demolished	
[illegible]			Demolished	
[illegible]			Demolished	
[illegible] - C	15'x20'	Pump House	Wood Frame, Corr. Alum.	1
[illegible]	9'x11'		Concrete Slab	1
			Demolished	
176			Demolished	
177	20'x20'	Slab	Concrete Slab	1
178	15'x15'	Slab	Concrete Slab	1
179	20'x20'	Slab	Concrete Slab	1
180 - C	10'x12'	Emergency Power Gen Shed	Wood Frame, Corr. Alum.	2
181	20'x20'	Old Shed	Wood	2
182				
183				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
188				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				

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SITE ELMER

BUILDING & STRUCTURE NUMBERS

HOLMES & NARVER, INC.

REVISED TO 1 OCT 1956

MISC. 416

NOTE: Any corrections or changes to this list should be made only on the master list which is maintained in the Office Engineering & Design Department of the Engineering Division.

GENERAL NOTES

1. For further information on [illegible] of buildings, refer to the As-Built [illegible].

*2. Column denoted by an asterisk contains numbers which represent General Layout Drawing Number or area on which building appears on the new 1" = 50' topographic sheets.

3. The building numbers in this index [illegible] Delong & Harper Plans, General Layout and Survey [illegible].

4. Symbol beside building number (M) [illegible] facilities owned building or structure.

5. Symbol beside building (C) indicates [illegible] owned building or structure that is capitalized, (i.e. [illegible]-Work-In-In-Progress.

USE	BLDG. NO.
AC Bldg., CM	333
Acetylene Storage	258
AEC Administration	209
AEC Motor Pool Bldg.	189
Announcers Booth	251 & 199
Assembly Building	411
Backstop	250
Bakery	202
Barge Slip, "U"	419
Baseball Field	199
Battery & Tire Shop	168
Beach Club (Riviera)	190
Beach Clubs (Lagoon - Miramar)	151-152
BIO-MED Building	218
Boc'n's Locker	174
Boiler House	203
Boiler House	301-301A
Boiler House	303
Boiler House	513
Bulk Storage	516
Camp Office	178
Carpenter Shop	317
Carpenter Shop	427
Cement Storage	420
Chapel	175 & 242
Chill Storage	238
Commissary	230
Commissary Office	219
Communications Bldg.	229
Control Building	311
Counting & Sampling Lab.	212A
Counting & Sampling Lab.	212B
Counting & Sampling Lab.	212C
Cylinder Racks	345A &B
Cylinder Shelters	340A to H
Day Room & Library	216
Decon. Area	249
Decon. Building	143
Deep Water Pier	142
Dentist Office	118
Diesel Storage	371-375
Diesel Storage	380
Diesel Storage	381
Diesel Storage	382
Diesel Storage (Land)	192
Distillation Plant	513
Distillation Main. Shop	514
DUKW, Meter Repair	322
DUKW Repair Shelter	360

USE	BLDG. NO.
Elec. Overhaul & Shops	310
Electrical Repair Shop	315
Elevated Water Storage (Area)	220
Elevated Water Storage (Pier)	349
Eng. Equip. Storage	226 & 241
Equipment Room	194-A
Fire Sta. & Quarters	205
Freight Cargo Pier	137
Fresh Water Storage	312
Fresh Water Storage	326
Galley	201
Garbage Building	254
Garbage Can Building	150
Gasoline Storage	376-379
Grease Rack	191
Guard & Const. Offices	177
Guardhouse, Assy. Area	414
Guard Post	213-214
Guard Post	332
Guard Shack	408
Guard Shelter (CMR)	362
Guard Tower	335-336
Gymnasium	179 - 244
Heavy Equipment	188
Heavy Equipment Machine Shop	405
Heavy Equipment Repair	421
Heavy Equipment Repair Shop	404
Heavy Equipment Shops	430
H.E. Riggers Loft	181
High Explosives Building	412
Hobby Shop	176 - 243
H&N Administration	208
H&N Administration	208A
H&N Motor Pool Bldg.	188
H&N Personnel	208B
Infirmary	117
Instrument Laboratory	211
Iron Workers Shed	399
JTF Recreation	432
Laboratory	223
Laboratory	231
Laboratory	329
Laboratory	330
Laboratory	344
Lab. Material Testing	309
Lanai	120
Latrine	165

USE	BLDG. NO.
Latrine (Ball Park)	240
Latrine & Showers	227-228
Latrine & Showers	233-236
Latrine (Mess Hall)	215
Latrine (100 Man)	680-684
Latrine, Warehouse Area	551
Latrine, Warehouse Area	552
Laundry	302
Lubrication Rack	167
Machine Shop	426
Magazine	351
Magazine	413
Magazine	415
Marine Elect. & Injector Shop	184
Marine Injector Shop	325
Marine Operations	406
Marine Welding Shop	429
Materials Testing Lab.	309
Mess Hall, 3 Wing	201
Mill & Saw Shed	186 & 428
Mogas Storage	383
Mogas Storage	384
Motor Pool Ad.	189
Motor Pool Hq.	188
M-Boat Ramp	138
M-Boat Ramp	139
M.P. Guards Tent	239
Nitrogen Storage	257
Nurses Quarters & Dentist	118
Operations Building	164
Oxygen Tabernacle	422
Paint Shop	424
Paint Shop & Parts Warehouse	401
Paint Storage	425
Pass & Badge Office	222
Personnel Pier	140
Photo Laboratory	210
Pier, Deep Water	142
Pier, Freight Barge	137
Pier, Personnel	140
Pier, Guard Shelter	187
Plumbing & Refrigeration	314
PO, PX, & Snack Bar	204
POL Pump House	300
Power Plant	339
Power & Distillation Plant	301-301A-301B
Pump House	162

USE	BLDG. NO.
Quarters, [illegible]	120
Quarters, 8 Man (Tent)	51-99A
Quarters, 8 Man (Tent)	99B-99H
Quarters, 18 Man	111-114
Quarters, 18 Man	115-116
Quarters, 18 Man	119
Quarters, 18 Man	121-130
Quarters, 4 Man (Tent)	1-50
Quarters, 36 Man	131-134
Quarters, 36 Man	206
Quarters, 36 Man	100-110
Quarters, 48 Man	135-136
Quarters, 48 Man	680-684
Quarters, 36 Man	144
Quarters, 8 Man	600-671
Quarters, 8 Man	145-146
Radio Repair Shop	180
Radsafe Building	323
Radsafe Hutment	324
Rank Diesel Storage	192
Receiving & Classified Mail	515
Recreation Bldg	185
Recreation Bldg	237
Reefer	217
Reefer Banks	196
Reefer Banks	197
Refrigeration Shop	316
Refreshment Bldg.	409
Refreshment Stand	252
Reservoir (2 Sections)	166
Salt Water Intake	347-A
Salt Water Intake	347-B
Salt Water Pump House	410
Saw Mill	428
Scientific User Shop	232
Scullery	201
Security Office	222
Sheet Metal Shop	314A
Shelter	331
Shelter	334
Skeet Range	141
Shop	342
Shop & Laboratory	418
Shop and Storage	341
Shop with Dehumidifier	194
Steam Cleaning for Marine Repair Shop	322A
Stock Building	299
Storage Tent, Tire Equipment	207
Storage Building (OMR)	350
Storage (Proposed)	245
Supply Dev. Off. & Store	313

USE	BLDG NO.
Tank (Water)	220
Task Force H)	221
Telemeter & Receiver Building	229
Television Center	338
Test Shelter (Arctic Camp)	193
Theater, open air	200
Tire Equip. Storage	207
Tower	406
Typewriter Repair Shop	318
Warehouse	319
Warehouse	320
Warehouse, Ammo	511
Warehouse, Ammo	512
Warehouse, Bulk Storage	516
Warehouse, Camp Supplies	507
Warehouse, Dry Stores	504
Warehouse, Electrical	501
Warehouse, Food	308
Warehouse, General Stores	509
Warehouse, Heavy Duty Parts	505
Warehouse, Plumbing	502
Warehouse, Property	508
Warehouse, Rec. & Class.	515
Warehouse, Ref. Marine & Power	506
Warehouse, Shipping	503
Warehouse, Tool Crib & Sta. Parts	510
Water Storage - Elevated	220 & 345
Water Storage, Press	312 & 326

BLDG. NO.	SIZE	USE	TYPE	
1-50 -	14'2"x14'4"	Quarters, 4 Man	Tent on Concrete Slab	5
51-82 -	15'10"x31'10"	Quarters, 8 Man	Tent on Concrete Slab	5
83-99A -	15'10"x31'10"	Quarters, 8 Man	Tent on Concrete Slab	7
99B-99H - M	15'10"x31'10"	Quarters, 8 Man	Tent on Concrete Slab	5
100-110 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	3
111-114-C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
115-116 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
117 - C	24'x92'8½"	Infirmary	Prefabricated Aluminum	3
118 - C	24'x44'8½"	Nurses Quarters & Dentist	Prefabricated Aluminum	3
119 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
120 - C	24'x68'8½"	Quarters & Lanai	Prefabricated Aluminum	3
	58'8"x20'8"	Lanai	Wood	3
121 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
122-130 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	5
131-132 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
133 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	1
134 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	1
135 - C	24'x168'8½"	Quarters, 48 Man w/Latrine	Prefabricated Aluminum	3
136 - C	24'x168'8½"	Quarters, 48 Man w/Latrine	Prefabricated Aluminum	3
137 - C	40'x180'	Freight Cargo Pier	Concrete - Steel - Wood	4
138 - C	50'x180'	M-Boat Ramp	Concrete	6
139 - C	50'x85'	M-Boat Ramp	Concrete	6
140 - C	30'x200'	Personnel Pier	Wood	8
141 - C		Skeet Range		7
142 - C		Deep Water and LST Pier	Wood on Steel Frame	2
143	38'x63'	36-Man Decontamination	Tents on Slab	8
144	24'x128'8½"	Assigned to Quarters, [illegible] Man	Prefabricated Aluminum	3
145	24'x128'8½"	Assigned to Quarters, [illegible] Man	Prefabricated Aluminum	3
146	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	5
147	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	4
148 - C	32'x60'	Volley Ball Court	Compacted Coral	3
149	14'2"x14'4"	Crew Chief Shelter	Tent (Type A)	8
150 - C	10'7"x10'10"	Garbage Can Building	Wood w/Concrete Floor	3
151 - C	32'x47'	Beach Club	Wood on Concrete Floor	6
151A	32'x47'	Life Guard Tower	Wood on Concrete Floor	8
152 - C	32'x47'	Life Guard Tower	Wood on Concrete Floor	8
153-158		[illegible]	Demolished	
159 - C	4'x20'	Gasoline Filling [illegible]	Pumps, Tanks & Concrete Slab	2
160-161		[illegible]	Demolished	
162 - C	10'x12'	[illegible]	Wood on Concrete Floor	2
163				
164 - C	16'x30'	Operations Bldg. (Airfield)	Wood & Aluminum on Conc. Floor	8
165 - C	10'x12'	Latrine	Wood on Concrete Floor	4
166	51'x6"x52'3"	Reservoir - Fresh Water Storage	Concrete, partly underground	4
167 - C	6'x24'	Lubrication [illegible]	Concrete	4
168 - C	10'8"x13'6"	Battery & Time Bldg.	Wood	4
	30'x50'			4
	38'x42'			
169 - C	32'x60'	Volley Ball Court	Compacted Coral	3
170A - C	32'x60'	Volley Ball Court	Compacted Coral	3
170B - C	32'x60'	Volley Ball Court	Compacted Coral	3
171 - C	30'x68'	Handball Court	Wood & Concrete Slab	3
172 - C	[illegible]	[illegible] Court	[illegible]	3

BLDG. NO.	SIZE	USE	TYPE
173 - C	32'x60'	Volley Ball Court	
174A - C	12'x12'x8'	Marine Ways Shed	Wood Frame, Plywood Siding
174B - C	12'x12'x8'	Marine Ways Shed	Wood Frame, Plywood Siding
174C - C	8'x10'x8'	Marine Ways Shed	Wood Frame, Plywood Siding
174 - C	20'x56'	Boatswain's Locker	Quonset
175 - C	20'x56'	Chapel	Quonset
176 - C	20'x56'	Hobby Shop	Quonset
177 - C	20'x56'	Guard & Const. Office	Quonset
178 - C	20'x56'	Camp Office	Quonset
179 - C	20'x56'	Gymnasium	Quonset
180 - C	20'x56'	Radio Repair Shop	Quonset
181 - C	20'x56'	M.T. Riggers Loft	Quonset
182		Supply Hardware Whse	(Demolished)
183		Beer & Elect.Eqmt. Whse	(Demolished)
184 - C		Marine Elect. & Inj. Shop	Jumbo Quonset
185 - C	20'x56'	Recreation Bldg.	Quonset
186 - C	20'x30'	Mill & Saw Shed	Wooden Shelter
187 - C	8'x12'	Pier Guard Shelter	Wood
188	10'x12'	H&N Motor Pool Disp. Heavy Equipment	Wood
189		AEC Motor Pool Disp.	(Demolished)
190 - C	32'x50'	Beach Club (Riviera)	Wood w/Concrete Floor
190A		Life Guard Tower	Wood
191	39'x16'	Timber Grease Rack	Wood
192 - C	7'x18'	Tank, Diesel Storage	Marine Steel, Welded Horiz 5000 Gallon
193	11'x12'	Admin. Compound Test Shelter	Wood
194 - C	24'x60'8½"	Shop with Dehumid. Eq	Prefabricated Aluminum
194A - C	15'2"x37'	Equipment Room	Wood
195		Shoe Shop	RAZED
196	21'4"x90'5"	Reefer Banks	Wood & Canvas Shelters
197	23'10"x80'6"	Reefer Banks	Wood & Canvas Shelters
198		Marine Electric Shop	RAZED
199 - C		Cooper Baseball Field & Announcer's Booth	Wood
200 - C	1350 Man	Theater, open air	Wood and Alum., Proj. Room Shelter, Seats, Stage & Screen
201 - C	3 - 24'x104'8½" 1 - 24'x84'8½"	Mess Hall, 3 wings	Prefabricated Aluminum
	24'x26'	Scullery	
	24'x110'8½"	Galley	
	24'x38'	Galley	
	24'x38'	Galley	
202 - C	24'x48'8½"	Bakery	Prefabricated Aluminum
203 - C	24'x24'8½"	Boiler House	Prefabricated Aluminum
204 - C	24'x128'8½"	PC, PX & Snack Bar	Prefabricated Aluminum
205 - C	24'x52'8½"	Police Sta. & Quarters	Prefabricated Aluminum
206 - C	24'x128'8½"	Quarters, 36 Men	Prefabricated Aluminum

BLDG. NO.	SIZE	USE	TYPE	
207		Storage Tent, Fire Equipment	(Demolished)	
208 C	24'x[illegible]'8½"	H&N Administration	"L" Shape, Prefabricated Aluminum	5
	24'x[illegible]'			5
208A - C	24'x[illegible]'8½"	H&N Administration	Prefabricated Aluminum	5
208B - C	24'x64'8½"	H&N Personnel	Prefabricated Aluminum	5
209 - C	24'x124'8½"	ABC Administration	Prefabricated Aluminum	5
	24'x118'8½"	"T" Shape	Prefabricated Aluminum	5
210 - C	24'x88'8½"	Photo Laboratory	Prefabricated Aluminum	5
211 - C	24'x128'8½"	Instrument Laboratory	Prefabricated Aluminum	5
	24'x74'8½"	Instrument Laboratory	Prefabricated Aluminum	5
212A - C	24'x16'8½"	Counting & Sampling Lab	Prefabricated Aluminum	5
212B - C	24'x24'8½"	Counting & Sampling Lab	Prefabricated Aluminum	5
212C - C	7'4"x7'4"	Counting & Sampling Lab	Wood Frame, Earth Covered	5
213 - C	4'x4'	Guard Post (Adm Comp).	Wood	5
214 - C	4'x4'	Guard Post (Adm Comp)	Wood	3
215 - C	9'x22'	Latrine (Mess Hall)	Prefabricated Aluminum	3
216 - C	24'x72'8½"	Day Room & Library	Prefabricated Aluminum	3
217 - C	24'x156'8½"	Roofer	Prefabricated Aluminum on Elevated Slab	3
218 - C	24'x36'8½"	BIO-MED. Building	Prefabricated Aluminum	9
219 - C	10'x10'2"	Commissary Office	Wood Frame, Wood Floor & Aluminum Roof	3
220 - C	27'x52'	Elevated Water Storage	50' Timber Tower	3
	1000 Bbl	Tank	Bolted Steel, Vertical	3
	500 Bbl	Tank	Bolted Steel, Vertical	3
221 - C	24'x158'8½"	Tank Force H.Q.	"L" Shape, Prefab Aluminum	
	3-24'x106'8½"		with 3 wings	5
222 C	24'x72'8½"	Pass & Badge Office	Prefabricated Aluminum	5
223 - C	24'x160'	Laboratory	Prefabricated Aluminum	5
224		Assigned to Communications Bldg.		5
225	16'x20'	Assigned to TV Film Process Lab.	Concrete Blocks	1
226	12'x14'	Radio Shop. Storage	Plywood - Wood Frame & Floor	1
227 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	6
228 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	6
229 - C	24'x12'8½"	Survey Field Office	Prefabricated Aluminum	1
230 - C	24'x68'8½"	Commissary	Prefabricated Aluminum	3
231 - C	24'x28'8½"	Laboratory	Prefabricated Aluminum	5
232 - C	24'x56'8½"	Scientific User Shop	Prefabricated Aluminum	5
233 - 234	25'x36'	Latrine & Showers	Wood & Aluminum	6
235 - 236	25'x36'	Latrine & Showers	Wood & Aluminum	7
237 - C	24'x144'8½"	Recreation Building	Prefabricated Aluminum	3
238 - C	24'x48'	Shell Storage	Concrete Block	3
239	16'x32'	Mess Guards Tent	6-Man Tent on Conc. Slab	4
240 - C	4'6"x8'	Latrine (Ballpark)	Wood Frame - Conc. Slab	4
241 - C	28'x30'	Add. to Fire Station #[illegible]	Prefabricated Aluminum	4
242 - C	25'x48'	Shops	Wood	3
	18'x25'			
243	24'x60'	Assigned to Hobby Shop	Prefabricated Aluminum	6
244	24'x60'	Assigned to Gymnasium	Prefabricated Aluminum	6
245	24'x50'	Assigned to Ventilated Storage Bldg.		3
246	16'x32'		Tent on Conc. Slab	4
247	16'x32'		Tent on Conc. Slab	4
248	90'x100'	Tractor Repair Mar[illegible]	Shelter	4
249 - C	150'x300'	Recor[illegible] Area	Trailer Shed & Slab - Fenced	7

BLDG. NO.	SIZE	USE	TYPE	
250 - C		Backstop & Locke Field	Wood & Wire, Locke Field	7
25 C	10'x10'	Announcers Booth	Wood, Locke Field	7
252 - C	25'x25'	Refreshment Stand	Wood, Lock Field	7
253 - C	8'x10'	Incinerator	Brick & Conc. Fenced	5
254 - C	10'7"x20'	Garbage Building	Wood, one Concrete w/Ramp	3
255	8'x12'	Acid House	Wood	4
256	10'x20'	Beach Combers Shack	Wood Frame, Corr. Metal Siding	5
257 - C	12'x12'	Nitrogen Storage	Canvas, on Wood Frame	1
258 -	24'x50'	Acetylene Storage	Canvas, on Wood Frame	1
259	9'x10'	Storage Shed	Wood	1
260	16'x32'	Scientific Tent	Tent on Coral Floor	1
261	16'x32'	Scientific Tent	Tent on Conc. Slab	1
262	16'x32'	Scientific Tent	Tent on Conc. Slab	1
263	16'x32'	Scientific Tent	Tent on Conc. Slab	1
264	10'x24'	Generator House	Wood Frame, Corr. Metal Siding	1
265	12'x15'	A.E.C. Motor Pool Dispatcher	Prefabricated Aluminum	3
266	10'x17'	Compressor Shed	Wood, Corr. Metal Roof, Dirt Floor	4
267	20'x20'	Vehicle Cleaning	Slab	4
268	10'x13'	Boiler House	Wood, Corr. Metal Roof, Conc. Floor	4
269	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
270	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
271	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
272	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
273	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
274	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
275	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
276	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
277	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
278	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
279	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
280	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
281	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
282	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
283	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
284	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
285	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
286	6'x8'	Storage Shed	Plywood Panal	5
287	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	6
288 - C	40'x40'	Volley Ball Court	Compacted Coral	6
289 - C	40'x60'	Volley Ball Court	Compacted Coral	6
290 - C	40'x60'	Volley Ball Court	Compacted Coral	7
291	17'x32'	Steel Shed	Wood & Canvas Roof	6
292	14'x23'	Welders Shed	Wood and Canvas, Dirt Floor	6
293 - C	6'x52'	Shuffle Board Court	Conc.	6
294 - C	6'x52'	Shuffle Board Court	Conc.	8
295 - C	6'x52'	Shuffle Board Court	Conc.	8
296 - C	6'x52'	Shuffle Board Court	Conc	11
297	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	7

BLDG. NO.	SIZE	USE	TYPE	
298	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	7
299 - C	40'x101'7"	Stock Bldg.	Butler type, Aluminum	4
30 - C	24'x32'8½"	POL Pump House	Prefabricated Aluminum	2
301 - C	52'x105'6½"	Power & Distill. Plant	Prefab Alum. & Reinf. Concrete	4
301A - C	24'x24'8½"	Boiler House	Prefabricated Aluminum	4
301B		Shelter for additional		
		dist. units	(Demolished)	
302 - C	24'x144'8½"	Laundry	Prefabricated Aluminum	4
	24'x42'8½"			
303 - C	24'x24'8½"	Boiler House	Prefabricated Aluminum	4
304		Diesel Storage	(Demolished)	
305		Diesel Storage	(Demolished)	
306	16'x32'	Storage	Tent on Conc. Slab	4
307		Gasoline Storage	(Demolished)	
308 - C	50'x100'8½"	Warehouse, Food	Prefabricated Aluminum	4
309 - C	24'x24'8½"	Materials Testing Lab	Prefabricated Aluminum	4
310 - C	40'x100'	Elec. Overhaul & Stor	Butler Building - Aluminum	4
311	24'x24'8½"	Control Building	Prefabricated Aluminum	4
312 - C	1000 Bbl	Fresh Water Storage	Tank, Redwood - , Vertical	4
313 - C	50'x100'8½"	Supply Div Off & Whse	Prefabricated Aluminum	4
314 - C	24'x80'8½"	Plumbing & Refrigeration	Prefabricated Aluminum	4
314A - C	24'x74'8½"	Sheet Metal Shop		4
315 - C	24'x60'8½"	Electrical Repair Shop	Prefabricated Aluminum	4
316 - C	24'x60'8½"	Refrigeration Shop	Prefabricated Aluminum	4
317 - C	24'x60'8½"	Carpenter Shop	Prefabricated Aluminum	4
318 - C	24'x32'8½"	Typewriter Repair Shop	Prefabricated Aluminum	4
319 - C			Conc. Slab	6
320 - C	40'x100'	Warehouse	Jumbo Quonset	6
321 - C	20'4"x43'0½"	Assigned to Heavy Equip. Rigging	Loft Structural Steel	
322 - C	24'x60'8½"	DUKW, Meter Repair	Prefabricated Aluminum	6
322A - C	10'x15'	Steam Cleaning Pad	Concrete & Wood	6
322B - C	11'x13'	Storage Shed	Plywood Panel, Corrugated Roof	6
322C -	7'x10'	Storage Shed	Plywood Panel	6
322D -	7'x8'	Storage Shed	Plywood Panel	6
323 -C	24'x96'8½"	Radsafe Building	Prefabricated Aluminum	8
	24'x12'			
323A - C	14'2"x14'4"	Protective Clothing Stor	Tent on Wood Floor (4 Man)	8
324 - C	6'x6'x8'	Radsafe Hutment	Wooden Frame	8
325	24'x48'	Assigned to Marine Injector	Shop Prefabricated Aluminum	6
326		Fresh Water Storage	(Demolished)	
327	5'x9'	Flake Ice Machine	Conc. Slab	3
328	5'x9'	Flake Ice Machine	Conc. Slab	3
329	24'x60'8½"	Laboratory	Prefabricated Aluminum	10
	10'8"x60'8½"			
330	40'x80'6"	Laboratory	Steel & Aluminum	10
	12'4"x19'8"			
	5'9"x8'8"			
331	8'2"x8'2"	Shelter	Concrete, Underground	10
332	4'x4'	Guard Post at Personnel Pier	Wood	8
333	15'x18'9"	AC Bldg., CMR	Wood and Aluminum	10
334	10'x10'	Shelter	Concrete Underground	10
335-336	6'x6'	Guard Tower	Wood, 8' above ground	10
337		Calibration Station	BLAZED	
338	24'x56'	Assigned to Television Center	Prefabricated Aluminum	9
339 C	64'6"x100'6"	Power Plant	Steel and Aluminum	9
339A		Repair Shed	Wood & Corr. Metal	
339B		"Cat" Gen. Housing	Wood & Corr. Metal	
340A to D	4-20'x40'	Cylinder Shelters	Wood	10
340E to H	4-20'x40'	Cylinder Shelters	Wood	

BLDG. NO.	SIZE	USE	TYPE	
341	21'x41'	Shop & Storage	Steel and Aluminum	10
	25'x10?'			
	13'x51'			
342	24'x60'8½"	Shop	Prefabricated Aluminum	10
342A - C	15'2"x25'8"	Dehumid. Section For Shop	Wood Frame - Plywood Siding	10
343 - C	9'x22'	K46B, Parry Is. Sta. or Radio Sta.	Old Field Kitchen	9
344	75'x80'6"	Laboratory	Steel Frame, Wood & Aluminum	
	22'x77'		Siding and Roof	10
345A & B	2-56'6"x80'6"	Cylinder Racks	Concrete	10
346		Golf Course		5
347A - C	17'6"x23'x10'6"	Salt Water Intake	Reinf. Concrete, Underground	10
347B - C	14'x14'	Pump Shelter	Wood Frame, Corr. Alum. Roof	10
348	14'x18'		Conc. Slab	8
349	30' High	Elevated Water Storage	Wood Tower	
	5000 Bbl		Steel Tank	10
350	12'8"x25'0"	Storage Bldg. (CMR)	Plywood Panel, Composition Roof	10
351	16'x25'	2000# Magazine (CM)	Steel Frame, Buried	10
351A	50'x50'		Concrete Slab	10
352	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	8
353	16'x32'	Quarters, 8 Man	Tent - Wood Floor	8
354	16'x32'	Quarters, 8 Man	Tent - Wood Floor	8
355	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	8
356	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	8
357	70'x100'	Decontamination Area	Fenced	8
358	56'x90'	Tennis Court		8
359	16'x32'		Conc. Slab	8
360 C	41'x54'	DUKW Repair Shelter	Canvas on Wood w/Concrete Slab	6
361				
362	8'x12'	Guard Shelter (CMR)	Wood, Aluminum Roof	8
363	20'x50'	Conc.	Conc. Slab	8
364	14'2"x14'4"	Scientific, 4 Man	Tent - Wood Floor	9
365	16'x32'		Conc. Slab	10
366	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	10
367	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	10
368 - C	1000 Bbl	Diesel Fuel Oil	Tank, Steel, Bolted, Vertical (T-1)	9
369 - C	1000 Bbl	Diesel Fuel Oil	Tank, Steel, Bolted, Vertical (T-2)	10
370 - C	1000 Bbl	Diesel Fuel Oil	Tank, Steel, Bolted, Vertical (T-3)	10
371-375		Diesel Storage	(Demolished)	
376-379 - C	4-10,000 Gal.	Gasoline Storage	Tank, Steel, Horizontal (Abandoned)	2
380 - C	1-10,000 Bbl	Diesel Storage	Tank, Steel, Vert. Welded	2
381 - C	1-10,000 Bbl	Diesel Storage	Tank, Steel, Vert. Welded	2
382 - C	1-10,000 Bbl	Diesel Storage	Tank, Steel, Vert. Welded	2
383 - C	1- 5,000 Bbl	Mogas Storage	Tank, Steel, Vert. Welded	2
384 - C	1- 5,000 Bbl	Mogas Storage	Tank, Steel, Vert. Welded	2
385				
386				
387				
388				
389				
390				
391				
392				

BLDG. NO.	SIZE	USE	TYPE	
3[illegible]				
394	5'x5'	Water Pump Pad	Concrete	11
395	8'x30'	Rock Crusher	Str. Steel on Conc. Fdn	11
396	12'x16'	Power Shed	Wood, Corr. Metal Roof	11
397	15'x20'	Batch Hopper	Str. Steel on conc. piers	11
398	10'x10'	Water Tower	Navy Cube on Timber Tower	11
399 - C	20'x20'	Iron Workers Shop	Wooden Frame	4
400		Electrical Warehouse	Demolished	
401 - C	40'x100'	Paint Shop & Parts Warehouse	Jumbo Quonset	4
402		Tool Crib & Parts Whse	Demolished	
403		Heavy Equip. Parts Whse	Demolished	
404 - C	40'x100'	Heavy Equipment Repr. Shop	Jumbo Quonset	4
404A - C	30'x30'	Welding Shop	Wood, Corr. Alum. Roof	4
405 - C	40'x100'	Heavy Equip. Machine Shop	Jumbo Quonset	4
406 - C	24'x60'	Marine Operations	Prefabricated Aluminum	4
	4'x4'12'	Tower	Wood on Conc. Piers	2
407	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	11
408 - C	4'x4'	Guard Shack	Wood	
409 - C	24'x44'8½"	Refreshment Bldg.	Prefabricated Aluminum	4
410 - C	24'x32'8½"	Salt Water Pump Sta.	Prefabricated Aluminum	4
411	44'x83'x34'9"	Assembly Building	Steel and Aluminum	11
412	25'6"x31'x18'[illegible]"	High Explosives Bldg	Steel and Aluminum	11
413	22'x22'x14'4"	Magazine	Concrete, Earth Covered	11
414	8'0"x12'0"	Guardhouse, Ass'y Area	Wood	11
41	21'4"x25'4"x12'6½"	Magazine	Concrete, Earth Covered	11
41[illegible]	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	11
417	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	11
418	25'0"x29'0"x9'9½"	Shop & Laboratory	Plywood, Conc. Floor, Corr. Roof	5
418A	20'0"x40'0"x13'9"		Wood Shelter	6
419	81'8"x136'8"	Barge Slip, "U" Shape Ass'y Area	Steel & Wooden Piling	11
420 - C	50'x60'	Marine Rigging Loft [illegible]	-Steel, Wood & Aluminum	6
421 - C	3200 Sq. Ft. 60'x40'	Heavy Equip. Repair	Concrete Slab	
422 - C	24'x40'	Oxygen Tabernacle	Wood w/Concrete Slab	1
423 - M	24'x40'	USF Recreation	Prefabricated Aluminum	5
424 - C	40'x100'	Paint Shop	Butler Type - Aluminum	6
425 - C	40'x60'	Paint Storage	Butler Type - Aluminum	6
426 - C	80'x100'	Machine Shop	Butler Type - Aluminum	6
42 7 - C	50'x80'	Assigned to Carpenter Shop	Butler Type - Aluminum	6
42 8	24'x80'	Assigned to Saw Mill	Prefabricated Aluminum	6
429	12'x24'	Marine Welding Shop	Prefabricated Aluminum	6
430	50'x300'	Assigned to Vehicle, Tire & Welding Shop	Butler Type - Aluminum	6
431	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
432	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
433 - C	46' High	Flag Pole	Steel Pipe	5
434 - C	22' High	Flag Pole	Steel Pipe	5
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BLDG. NO.	SIZE	USE	TYPE
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~~OFFICIAL USE ONLY~~

BLDG. NO.	SIZE	USE	TYPE	
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501 - C	40'x180'	Warehouse, Electrical	Prefabricated Aluminum	4
502 - C	40'x180'	Warehouse, Plumbing	Prefabricated Aluminum	4
503 - C	40'x101'	Warehouse, Shipping	Prefabricated Aluminum	4
504 - C	40'x100'	Whse. Dry Stores	Prefabricated Aluminum	4
505-6 - C	80'x180'	Whse., Heavy Duty Parts	Prefabricated Aluminum	4
507-8 - C	80'x140'	Whse., Camp Supplies	Prefabricated Aluminum	4
509-10 - C	80'x100'	Whse., General Stores	Prefabricated Aluminum	4
511 - 512 - C	80'x100'	Warehouse, A.E.C.	Prefabricated Aluminum	4
512 - C				4
513	24'2"x60'1½"	New Distillation Plant	Prefabricated Steel	4
514	24'x40'	Assigned to Distillation Maintenance Shop	Prefabricated Steel	4 4
515 - C	50'2"x80'	Receiving & Classification Whse	Prefabricated Steel	2
51	40'x140'	Assigned to Bulk Storage Whse	Butler Bldg.	4
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BLDG. NO.	SIZE	USE	TYPE	
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551 - C	10'x12'	Latrine, Warehouse Area	Aluminum	4
552 - C	10'x12'	Latrine, Warehouse Area	Aluminum	4
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BLDG. NO.	SIZE	USE	TYPE	
606-627	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	3
628-645	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	4
646				
647-651	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	4
652 - 671	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	3
680 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
681 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
682 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
683 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
684 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3

	0	1	2	3	4	5	6	7	8	9
		2.98	2.93	2.887	2.915	1.163	1.147	1.002	1	2.01
10	3.220	4.129	4.265	4.284	4.218	3.344	3.043	3.902	4.1	3.34
20	5.291	5.129	5.050	5.231	5.310	5.159	5.069	6.492	6.0	5.87
30	7.357	7.117	7.356	7.076	7.405	7.062	8.264	8.491	8.1	7.933
40	9.163	9.429	9.647	9.871	9.79	10.83	10.08	10.79	11.2	11.26
50	11.46	11.7	11.76	12.07	12.03	12.68	12.86	13.59	13.9	13.98
60	13.77	14.0	14.28	14.68	14.82	14.92	15.25	15.57	15.9	15.94
70	16.07	16.3	16.56	16.26	16.12	17.22	17.46	17.79	17.9	18.14
80	18.37	18.6	18.82	19.09	19.27	19.5	19.79	19.97	20.2	20.15
90	20.66	20.9	21.12	21.32	21.19	21.81	22.04	22.27	22.6	22.78
100	22.96	23.1	23.3	23.5	23.7	24.12	24.32	24.56	24.74	25.02
110	25.25	25.4	25.7	25.96	26.1	26.4	26.65	26.89	27.09	27.32
120	27.55	27.7	28.0	28.20	28.2	28.7	28.95	29.19	29.4	29.61
130	29.84	30.0	30.3	30.45	30.47	30.7	31.22	31.45	31.69	31.91
140	32.14	32.3	32.60	32.83	32.86	33.0	33.52	33.75	33.98	34.21
150	34.44	34.6	34.9	35.13	35.15	35.3	35.81	36.04	36.2	36.50
160	36.73	36.9	37.2	37.42	37.45	37.6	38.11	38.34	38.5	38.80
170	39.03	39.2	39.5	39.72	39.75	39.9	40.40	40.63	40.8	41.09
180	41.32	41.55	41.8	42.03	42.04	42.2	42.70	42.93	43.1	43.39
190	43.62	43.85	44.1	44.32	44.3	44.5	45.00	45.23	45.4	45.68
200	45.91	46.14	46.4	46.62	46.60	46.8	47.29	47.52	47.7	47.98
210	48.21	48.44	48.7	48.91	48.9	49.1	49.59	49.82	50.0	50.28
220	50.51	50.73	51.0	51.21	51.2	51.4	51.88	52.11	52.34	52.57
230	52.80	53.03	53.3	53.50	53.5	53.7	54.18	54.41	54.64	54.8
240	55.10	55.33	55.6	55.79	55.8	56.0	56.47	56.70	56.9	57.15
250	57.39	57.62	57.9	58.08	58.1	58.3	58.77	59.00	59.23	59.46
260	59.69	59.92	60.2	60.38	60.4	60.6	61.07	61.29	61.52	61.75
270	61.98	62.21	62.4	62.67	62.7	62.9	63.36	63.59	63.82	64.05
280	64.28	64.51	64.7	64.97	65.0	65.2	65.66	65.89	66.12	66.35
290	66.57	66.80	67.0	67.26	67.3	67.5	67.95	68.18	68.41	68.64
300	68.87	69.10	69.3	69.56	69.6	69.8	70.25	70.48	70.71	70.94
310	71.17	71.40	71.6	71.85	71.9	72.1	72.54	72.77	73.00	73.23
320	73.46	73.69	73.9	74.15	74.2	74.4	74.84	75.07	75.3	75.53
330	75.76	75.99	76.2	76.40	76.5	76.7	77.13	77.36	77.59	77.82
340	78.05	78.28	78.5	78.72	78.8	79.0	79.43	79.66	79.9	80.12
350	80.35	80.58	80.8	81.05	81.1	81.3	81.73	81.96	82.19	82.42
360	82.64	82.87	83.10	83.35	83.4	83.6	84.03	84.26	84.5	84.71
370	84.94	85.1	85.39	85.65	85.7	85.9	86.32	86.55	86.8	87.01
380	87.24	87.4	87.69	87.92	88.0	88.2	88.62	88.85	89.0	89.3
390	89.53	89.7	89.99	90.22	90.3	90.5	90.93	91.14	91.4	
400	91.83	92.0	92.29	92.52	92.6	92.8	93.20	93.4	93.6	93.9
410	94.12	94.3	94.58	94.81	94.9	95.1	95.50	95.7	95.9	96.1
420	96.42	96.6	96.88	97.11	97.2	97.4	97.79	98.0	98.2	98.4
430	98.71	98.9	99.17	99.40	99.5	99.7	100.1	100.3	100.5	100.7
440	101.0	101.2	101.5	101.7	101.8	102.0	102.4	102.6	102.8	103.1
450	103.3	103.5	103.7	103.9	104.0	104.2	104.7	104.9	105.1	105.4
460	105.6	105.8	106.0	106.3	106.4	106.6	107.0	107.2	107.4	107.7
470	107.9	108.1	108.4	108.6	108.7	108.9	109.3	109.5	109.7	110.0
480	110.2	110.4	110.7	110.9	111.0	111.2	111.6	111.8	112.0	112.3
490	112.5	112.7	113.0	113.2	113.3	113.5	113.9	114.1	114.3	114.5
500	114.8	115.0	115.2	115.5	115.6	115.8	116.2	116.4	116.6	116.8

VOLUME IN CUBIC FEET PER ACRE IN EACH GRADE OF 0.1 INCH

Acres	0	1	2	3	4	5	6	7	8	9
		16.3	32.7	48.9	65.2	81.6	97.8	114.1	130.4	146.7
1	163.0	179.3	195.6	211.9	228.2	244.5	260.8	277.1	293.4	309.7
2	326.0	342.3	358.6	374.9	391.2	407.5	423.8	440.1	456.4	472.7
3	489.0	505.3	521.6	537.9	554.2	570.5	586.8	603.1	619.4	635.7
4	652.0	668.3	684.6	700.9	717.2	733.5	749.8	766.1	782.4	798.7
5	815.0	831.3	847.6	863.9	880.2	896.5	912.8	929.1	945.4	961.7
6	978.0	994.3	1010.6	1026.9	1043.2	1059.5	1075.8	1092.1	1108.4	1124.7
7	1141.0	1157.3	1173.6	1189.9	1206.2	1222.5	1238.8	1255.1	1271.4	1287.7
8	1304.0	1320.3	1336.6	1352.9	1369.2	1385.5	1401.8	1418.1	1434.4	1450.7
9	1467.0	1483.3	1499.6	1515.9	1532.2	1548.5	1564.8	1581.1	1597.4	1613.7
10	1630.0	1646.3	1662.6	1678.9	1695.2	1711.5	1727.8	1744.1	1760.4	1776.7
11	1793.0	1809.3	1825.6	1841.9	1858.2	1874.5	1890.8	1907.1	1923.4	1939.7
12	1956.0	1972.3	1988.6	2004.9	2021.2	2037.5	2053.8	2070.1	2086.4	2102.7
13	2119.0	2135.3	2151.6	2167.9	2184.2	2200.5	2216.8	2233.1	2249.4	2265.7
14	2282.0	2298.3	2314.6	2330.9	2347.2	2363.5	2379.8	2396.1	2412.4	2428.7
15	2445.0	2461.3	2477.6	2493.9	2510.2	2526.5	2542.8	2559.1	2575.4	2591.7
16	2608.0	2624.3	2640.6	2656.9	2673.2	2689.5	2705.8	2722.1	2738.4	2754.7
17	2771.0	2787.3	2803.6	2819.9	2836.2	2852.5	2868.8	2885.1	2901.4	2917.7
18	2934.0	2950.3	2966.6	2982.9	2999.2	3015.5	3031.8	3048.1	3064.4	3080.7
19	3097.0	3113.3	3129.6	3145.9	3162.2	3178.5	3194.8	3211.1	3227.4	3243.7
20	3260.0	3276.3	3292.6	3308.9	3325.2	3341.5	3357.8	3374.1	3390.4	3406.7
21	3423.0	3439.3	3455.6	3471.9	3488.2	3504.5	3520.8	3537.1	3553.4	3569.7
22	3586.0	3602.3	3618.6	3634.9	3651.2	3667.5	3683.8	3700.1	3716.4	3732.7
23	3749.0	3765.3	3781.6	3797.9	3814.2	3830.5	3846.8	3863.1	3879.4	3895.7
24	3912.0	3928.3	3944.6	3960.9	3977.2	3993.5	4009.8	4026.1	4042.4	4058.7
25	4075.0	4091.3	4107.6	4123.9	4140.2	4156.5	4172.8	4189.1	4205.4	4221.7
26	4238.0	4254.3	4270.6	4286.9	4303.2	4319.5	4335.8	4352.1	4368.4	4384.7
27	4401.0	4417.3	4433.6	4449.9	4466.2	4482.5	4498.8	4515.1	4531.4	4547.7
28	4564.0	4580.3	4596.6	4612.9	4629.2	4645.5	4661.8	4678.1	4694.4	4710.7
29	4727.0	4743.3	4759.6	4775.9	4792.2	4808.5	4824.8	4841.1	4857.4	4873.7
30	4890.0	4906.3	4922.6	4938.9	4955.2	4971.5	4987.8	5004.1	5020.4	5036.7
31	5053.0	5069.3	5085.6	5101.9	5118.2	5134.5	5150.8	5167.1	5183.4	5199.7
32	5216.0	5232.3	5248.6	5264.9	5281.2	5297.5	5313.8	5330.1	5346.4	5362.7
33	5379.0	5395.3	5411.6	5427.9	5444.2	5460.5	5476.8	5493.1	5509.4	5525.7
34	5542.0	5558.3	5574.6	5590.9	5607.2	5623.5	5639.8	5656.1	5672.4	5688.7
35	5705.0	5721.3	5737.6	5753.9	5770.2	5786.5	5802.8	5819.1	5835.4	5851.7
36	5868.0	5884.3	5900.6	5916.9	5933.2	5949.5	5965.8	5982.1	5998.4	6014.7
37	6031.0	6047.3	6063.6	6079.9	6096.2	6112.5	6128.8	6145.1	6161.4	6177.7
38	6194.0	6210.3	6226.6	6242.9	6259.2	6275.5	6291.8	6308.1	6324.4	6340.7
39	6357.0	6373.3	6389.6	6405.9	6422.2	6438.5	6454.8	6471.1	6487.4	6503.7
40	6520.0	6536.3	6552.6	6568.9	6585.2	6601.5	6617.8	6634.1	6650.4	6666.7
41	6683.0	6699.3	6715.6	6731.9	6748.2	6764.5	6780.8	6797.1	6813.4	6829.7
42	6846.0	6862.3	6878.6	6894.9	6911.2	6927.5	6943.8	6960.1	6976.4	6992.7
43	7009.0	7025.3	7041.6	7057.9	7074.2	7090.5	7106.8	7123.1	7139.4	7155.7
44	7172.0	7188.3	7204.6	7220.9	7237.2	7253.5	7269.8	7286.1	7302.4	7318.7
45	7335.0	7351.3	7367.6	7383.9	7400.2	7416.5	7432.8	7449.1	7465.4	7481.7
46	7498.0	7514.3	7530.6	7546.9	7563.2	7579.5	7595.8	7612.1	7628.4	7644.7
47	7661.0	7677.3	7693.6	7709.9	7726.2	7742.5	7758.8	7775.1	7791.4	7807.7
48	7824.0	7840.3	7856.6	7872.9	7889.2	7905.5	7921.8	7938.1	7954.4	7970.7
49	7987.0	8003.3	8019.6	8035.9	8052.2	8068.5	8084.8	8101.1	8117.4	8133.7
50	8150.0	8166.3	8182.6	8198.9	8215.2	8231.5	8247.8	8264.1	8280.4	8296.7
51	8313.0	8329.3	8345.6	8361.9	8378.2	8394.5	8410.8	8427.1	8443.4	8459.7
52	8476.0	8492.3	8508.6	8524.9	8541.2	8557.5	8573.8	8590.1	8606.4	8622.7
53	8639.0	8655.3	8671.6	8687.9	8704.2	8720.5	8736.8	8753.1	8769.4	8785.7
54	8802.0	8818.3	8834.6	8850.9	8867.2	8883.5	8899.8	8916.1	8932.4	8948.7
55	8965.0	8981.3	8997.6	9013.9	9030.2	9046.5	9062.8	9079.1	9095.4	9111.7
56	9128.0	9144.3	9160.6	9176.9	9193.2	9209.5	9225.8	9242.1	9258.4	9274.7
57	9291.0	9307.3	9323.6	9339.9	9356.2	9372.5	9388.8	9405.1	9421.4	9437.7
58	9454.0	9470.3	9486.6	9502.9	9519.2	9535.5	9551.8	9568.1	9584.4	9600.7
59	9617.0	9633.3	9649.6	9665.9	9682.2	9698.5	9714.8	9731.1	9747.4	9763.7
60	9780.0	9796.3	9812.6	9828.9	9845.2	9861.5	9877.8	9894.1	9910.4	9926.7
61	9943.0	9959.3	9975.6	9991.9	10008.2	10024.5	10040.8	10057.1	10073.4	10089.7
62	10106.0	10122.3	10138.6	10154.9	10171.2	10187.5	10203.8	10220.1	10236.4	10252.7
63	10269.0	10285.3	10301.6	10317.9	10334.2	10350.5	10366.8	10383.1	10399.4	10415.7
64	10432.0	10448.3	10464.6	10480.9	10497.2	10513.5	10529.8	10546.1	10562.4	10578.7
65	10595.0	10611.3	10627.6	10643.9	10660.2	10676.5	10692.8	10709.1	10725.4	10741.7
66	10758.0	10774.3	10790.6	10806.9	10823.2	10839.5	10855.8	10872.1	10888.4	10904.7
67	10921.0	10937.3	10953.6	10969.9	10986.2	11002.5	11018.8	11035.1	11051.4	11067.7
68	11084.0	11100.3	11116.6	11132.9	11149.2	11165.5	11181.8	11198.1	11214.4	11230.7
69	11247.0	11263.3	11279.6	11295.9	11312.2	11328.5	11344.8	11361.1	11377.4	11393.7
70	11410.0	11426.3	11442.6	11458.9	11475.2	11491.5	11507.8	11524.1	11540.4	11556.7
71	11573.0	11589.3	11605.6	11621.9	11638.2	11654.5	11670.8	11687.1	11703.4	11719.7
72	11736.0	11752.3	11768.6	11784.9	11801.2	11817.5	11833.8	11850.1	11866.4	11882.7
73	11899.0	11915.3	11931.6	11947.9	11964.2	11980.5	11996.8	12013.1	12029.4	12045.7
74	12062.0	12078.3	12094.6	12110.9	12127.2	12143.5	12159.8	12176.1	12192.4	12208.7
75	12225.0	12241.3	12257.6	12273.9	12290.2	12306.5	12322.8	12339.1	12355.4	12371.7
76	12388.0	12404.3	12420.6	12436.9	12453.2	12469.5	12485.8	12502.1	12518.4	12534.7
77	12551.0	12567.3	12583.6	12599.9	12616.2	12632.5	12648.8	12665.1	12681.4	12697.7
78	12714.0	12730.3	12746.6	12762.9	12779.2	12795.5	12811.8	12828.1	12844.4	12860.7
79	12877.0	12893.3	12909.6	12925.9	12942.2	12958.5	12974.8	12991.1	13007.4	13023.7
80	13040.0	13056.3	13072.6	13088.9	13105.2	13121.5	13137.8	13154.1	13170.4	13186.7
81	13203.0	13219.3	13235.6	13251.9	13268.2	13284.5	13300.8	13317.1	13333.4	13349.7
82	13366.0	13382.3	13398.6	13414.9	13431.2	13447.5	13463.8	13480.1	13496.4	13512.7
83	13529.0	13545.3	13561.6	13577.9	13594.2	13610.5	13626.8	13643.1	13659.4	13675.7
84	13692.0	13708.3	13724.6	13740.9	13757.2	13773.5	13789.8	13806.1	13822.4	13838.7
85	13855.0	13871.3	13887.6	13903.9	13920.2	13936.5	13952.8	13969.1	13985.4	14001.7
86	14018.0	14034.3	14050.6	14066.9	14083.2	14099.5	14115.8	14132.1	14148.4	14164.7
87	14181.0	14197.3	14213.6	14229.9	14246.2	14262.5	14278.8	14295.1	14311.4	14327.7
88	14344.0	14360.3	14376.6	14392.9	14409.2	14425.5	14441.8	14458.1	14474.4	14490.7
89	14507.0	14523.3	14539.6	14555.9	14572.2	14588.5	14604.8	14621.1	14637.4	14653.7
90	14670.0	14686.3	14702.6	14718.9	14735.2	14751.5	14767.8	14784.1	14800.4	14816.7
91	14833.0	14849.3	14865.6	14881.9	14898.2	14914.5	14930.8	14947.1	14963.4	14979.7
92	14996.0	15012.3	15028.6	15044.9	15061.2	15077.5	15093.8	15110.1	15126.4	15142.7
93	15159.0	15175.3	15191.6	15207.9	15224.2	15240.5	15256.8	15273.1	15289.4	15305.7
94	15322.0	15338.3	15354.6	15370.9	15387.2	15403.5	15419.8	15436.1	15452.4	15468.7
95	15485.0	15501.3	15517.6	15533.9	15550.2	15566.5	15582.8	15599.1	15615.4	15631.7
96	15648.0	15664.3	15680.6	15696.9	15713.2	15729.5	15745.8	15762.1	15778.4	15794.7
97	15811.0	15827.3	15843.6	15859.9	15876.2	15892.5	15908.8	15925.1	15941.4	15957.7
98	15974.0	15990.3	16006.6	16022.9	16039.2	16055.5	16071.8	16088.1	16104.4	16120.7
99	16137.0	16153.3	16169.6	16185.9	16202.2	16218.5	16234.8	16251.1	16267.4	16283.7

[illegible]

[illegible] AND [illegible]

5 OCTOBER 1953

[illegible]
Deviation in feet from a straight line tangent to the earth.
Distance in feet from point of tangency.

DISTANCE		CORRECTION	DISTANCE		CORRECTION
[illegible]	[illegible]	[illegible]	[illegible]	- 1349.03	.043
[illegible]	[illegible]	[illegible]	[illegible]	- 1364.42	.044
[illegible]	- 325.40	[illegible]	[illegible]	- 1379.09	.045
[illegible]	[illegible]	[illegible]	[illegible]	- 1394.68	.046
[illegible]	[illegible]	[illegible]	[illegible]	- 1409.04	.047
[illegible]	[illegible]	[illegible]	1409.04	- 1424.44	.048
479.07	[illegible]	[illegible]	1424.44	- 1439.06	.049
[illegible]	[illegible]	[illegible]	[illegible]	- 1453.49	.050
560.1?	[illegible]	[illegible]	[illegible]	- 1467.95	.051
596.35	- 631.44	[illegible]	[illegible]	- 1482.01	.052
630.44	- 662.78	[illegible]	[illegible]	- 1496.05	.053
[illegible]	[illegible]	[illegible]	[illegible]	- 1509.95	.054
693.63	[illegible]	[illegible]	1509.95	- 1523.73	.065
[illegible]	[illegible]	[illegible]	[illegible]	- 1537.44	.056
[illegible]	[illegible]	[illegible]	[illegible]	- 1550.96	.057
[illegible]	[illegible]	[illegible]	[illegible]	- 1564.42	.058
[illegible]	[illegible]	[illegible]	1564.44	- 1577.74	.059
830.8?	[illegible]	[illegible]	[illegible]	- 1590.93	.060
[illegible]	[illegible]	[illegible]	1590.93	- 1603.96	.061
[illegible]	[illegible]	[illegible]	1603.96	- 1617.00	.062
[illegible]	[illegible]	[illegible]	[illegible]	- 1629.87	.063
[illegible]	[illegible]	[illegible]	[illegible]	- 1642.68	.064
[illegible]	[illegible]	[illegible]	[illegible]	- 1655.29	.065
[illegible]	- 9?1.54	[illegible]	[illegible]	- 1667.90	.066
[illegible]	-1002.37	[illegible]	[illegible]	- 1680.37	.067
[illegible]	[illegible]	[illegible]	[illegible]	- 1692.[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	- 1705.16	.069
[illegible]	[illegible]	[illegible]	[illegible]	- 1717.38	.070
[illegible]	[illegible]	[illegible]	[illegible]	- 1729.48	.071
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	- 1753.54	.073
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.074
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.075
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.079
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.080
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

89

DISTANCE			CORRECTION
[illegible]	-	1912.30	[illegible]
1912.30	-	1913.23	[illegible]
1913.23	-	1924.17	.089
1924.17	-	1935.03	.090
1935.03	-	1945.77	.090
1945.77	-	1956.51	.091
1956.51	-	1967.18	.092
1967.18	-	1977.79	.093
1977.79	-	1988.33	.094
1988.33	-	1998.81	.095
1998.81	-	2009.22	.096
2009.22	-	2019.63	.097
2019.63	-	2029.98	.098
2029.98	-	2040.27	.099
2040.27	-	2050.49	.100
2050.49	-	2060.64	.101
2060.64	-	2071.44	.102
2071.44	-	2080.88	.103
2080.88	-	2090.91	.104
2090.91	-	2100.87	.105
2100.87	-	2114.00	.106
2114.00	-	2120.66	.107
2120.66	-	2130.49	.108
2130.49	-	2140.33	.109
2140.33	-	2150.09	.110
2150.09	-	2159.79	.111
2159.79	-	2169.43	.112
2169.43	-	2179.07	.113
2179.07	-	2188.64	.114
2188.64	-	2198.21	.115
2198.21	-	2207.66	.116
2207.66	-	2217.10	.117
2217.10	-	2226.54	.118
2226.54	-	2235.92	.119
2235.92	-	2245.24	.120
2245.24	-	2254.55	.121
2254.55	-	2263.80	.122
2263.80	-	2273.05	.123
2273.05	-	2282.23	.124
2282.23	-	2291.35	.125
2291.35	-	2300.67	.126
2300.67	-	2309.53	.127
2309.53	-	2318.56	.128
2318.56	-	2327.57	.129
2327.57	-	2336.57	.130
2336.57	-	2345.48	.131
2345.48	-	2354.38	.132
2354.38	-	2363.29	.133
[illegible]			

DISTANCE			CORRECTION
[illegible]	-	2415.73	.139
[illegible]	-	2424.40	.140
2424.40	-	2433.00	.141
2433.00	-	2441.60	.142
2441.60	-	2450.14	.143
[illegible]	-	2458.68	.144
[illegible]	-	2467.22	.145
2467.22	-	2475.63	.146
2475.63	-	2484.10	.147
2484.10	-	2492.51	.148
2492.51	-	2500.85	.149
2500.85	-	2509.19	.150
2509.19	-	2517.54	.151
2517.54	-	2525.81	.152
2525.81	-	2534.10	.153
2534.10	-	2542.24	.154
2542.24	-	2550.59	.155
2550.59	-	2558.74	.156
2558.74	-	2566.96	.157
2566.96	-	2575.04	.158
2575.04	-	2583.90	.159
2583.90	-	2591.21	.160
2591.21	-	2599.29	.161
2599.29	-	2607.32	.162
2607.32	-	2615.34	.163
2615.34	-	2623.36	.164
2623.36	-	2631.47	.165
2631.47	-	2639.20	.166
2639.20	-	2647.16	.167
2647.16	-	2654.98	.168
2654.98	-	2662.88	.169
2662.88	-	2670.70	.170
2670.70	-	2678.53	.171
2678.53	-	2686.54	.172
2686.54	-	2694.14	.173
2694.14	-	2701.88	.174
[illegible]	-	2709.64	.175
[illegible]	-	2717.34	.176
[illegible]	-	2724.97	.177
[illegible]	-	2732.73	.178
[illegible]	-	2740.31	.179
[illegible]	-	2747.93	.180
[illegible]	-	2755.56	.181
[illegible]	-	2763.15	.182
[illegible]			

DISTANCE			CORRECTION
[illegible]	-	2837.84	[illegible]
[illegible]	-	2845.21	[illegible]
[illegible]	-	2852.58	[illegible]
[illegible]	-	2859.95	[illegible]
[illegible]	-	2867.32	[illegible]
[illegible]	-	2874.44	[illegible]
2874.44	-	2881.75	.198
2881.75	-	2888.9[illegible]	.199
2888.[illegible]	-	2896.37	.200
2896.37	-	2903.42	.201
2903.42	-	2910.[illegible]	.202
2910.[illegible]	-	2917.[illegible]	.203
2917.[illegible]	-	2924.[illegible]	.204
2924.96	-	2932.[illegible]	.205
2932.[illegible]	-	2939.19	.206
2939.19	-	2946.30	.207
2946.30	-	2953.42	.208
2953.42	-	2960.47	.209
2960.47	-	2967.52	.210
2967.52	-	2974.63	.211
2974.63	-	2981.55	.212
2981.55	-	2988.60	.213
2988.60	-	2995.59	.214
2995.59	-	3002.75	.215
3002.75	-	3009.50	.216
3009.50	-	3016.48	.217
3016.48	-	3023.40	.218
3023.40	-	3030.32	.219
3030.32	-	3037.24	.220
3037.24	-	3044.10	.221
3044.10	-	3050.56	.222
3050.56	-	3057.81	.223
3057.81	-	3064.[illegible]	.224
3064.60	-	3071.46	.225
3071.46	-	3078.25	.226
3078.25	-	3085.04	.227
3085.04	-	3091.83	.228
3091.83	-	3098.[illegible]	.229
3098.[illegible]	-	3105.29	.230
3105.29	-	3112.01	.231
3112.01	-	3118.87	.232
3118.87	-	3125.47	.233
3125.47	-	3132.19	.234
3132.19	-	3138.79	.235
3138.79	-	3145.45	.236
3145.45	-	3152.12	.237
3152.12	-	3158.[illegible]	.238
3158.[illegible]	-	3165.[illegible]	.239
3165.[illegible]	-	3171.[illegible]	.240
3171.[illegible]	-	3178.[illegible]	.241
3178.[illegible]	-	3185.[illegible]	.242

DISTANCE			CORRECTION
[illegible]	-	3191.63	.243
[illegible]	-	3198.23	.244
[illegible]	-	3204.89	.245
[illegible]	-	3211.23	.246
[illegible].23	-	3217.77	.247
[illegible]	-	3224.30	.248
[illegible]	-	3230.77	.249
[illegible]	-	3237.23	.250
[illegible].2[illegible]	-	3243.70	.251
[illegible]	-	3250.17	.252
[illegible]	-	3256.51	.253
[illegible]	-	3263.98	.254
[illegible]	-	3269.38	.255
[illegible]	-	3275.98	.256
[illegible]	-	3282.12	.257
[illegible]	-	3288.53	.258
[illegible]	-	3294.86	.259
[illegible]	-	3301.20	.260
[illegible]	-	3307.54	.261
[illegible]	-	3313.88	.262
[illegible]	-	3320.22	.263
[illegible].22	-	3326.49	.264
[illegible]	-	3332.77	.265
[illegible]	-	3339.62	.266
[illegible]	-	3345.31	.267
[illegible]	-	3351.52	.268
3351.52	-	3357.73	.269
3357.73	-	3364.01	.270
3364.01	-	3370.22	.271
[illegible].22	-	3376.43	.272
3376.43	-	3382.57	.273
[illegible].57	-	3388.78	.274
3388.78	-	3394.99	.275
[illegible].99	-	3401.68	.276
[illegible]	-	3407.28	.277
[illegible]	-	3413.36	.278
[illegible]	-	3419.50	.279
[illegible]	-	3425.58	.280
[illegible]	-	3431.60	.281
[illegible]	-	3437.74	.282
[illegible].74	-	3443.89	.283
[illegible]	-	3449.67	.284
[illegible]	-	3455.98	.285
[illegible].98	-	3462.71	.286
[illegible].71	-	3468.08	.287
[illegible].08	-	3473.96	.288
[illegible]	-	3480.10	.289
[illegible]	-	3486.12	.290
[illegible]	-	3492.14	.291
[illegible]	-	[illegible]	[illegible]
[illegible]	-	[illegible]	[illegible]

DISTANCE			CORRECTION
3504.10	-	3511.05	.291
3510.05	-	3516.00	.292
3516.00	-	3522.47	.296
3522.47	-	3527.91	.297
3527.91	-	3533.86	.298
3533.86	-	3539.68	.299
3539.68	-	3545.63	.300
3545.63	-	3550.93	.301
3550.93	-	3557.40	.302
3557.40	-	3563.22	.303
3563.22	-	3569.17	.304
3569.17	-	3574.99	.305
3574.99	-	3580.88	.306
3580.88	-	3586.70	.307
3586.70	-	3592.21	.308
3592.21	-	3598.34	.309
3598.34	-	3604.16	.310
3604.16	-	3609.92	.311
3609.92	-	3615.74	.312
3615.74	-	3622.08	.313
3622.08	-	3627.25	.314
3627.25	-	3633.01	.315
3633.01	-	3638.77	.316
3638.77	-	3644.52	.317
3644.52	-	3650.28	.318
3650.28	-	3655.97	.319
3655.97	-	3661.73	.320
3661.73	-	3667.42	.321
3667.42	-	3673.11	.322
3673.11	-	3678.80	.323
3678.80	-	3684.50	.324
3684.50	-	3690.18	.325
3690.18	-	3695.82	.326
3695.82	-	3701.51	.327
3701.51	-	3707.13	.328
3707.13	-	3712.76	.329
3712.76	-	3718.39	.330
3718.39	-	3724.02	.331
3724.02	-	3729.64	.332
3729.64	-	3735.21	.333
3735.21	-	3740.32	.334
3740.32	-	3746.39	.335
3746.39	-	3752.02	.336
3752.02	-	3757.58	.337
3757.58	-	3763.15	.338
3763.15	-	3768.64	.339
3768.64	-	3774.31	.340
3774.31	-	3779.99	.341
3779.99	-	3785.33	.342
3785.33	-	3790.13	.343
3790.13	-	3796.33	.344

DISTANCE			CORRECTION
3801.83	-	3807.39	.346
3807.39	-	3812.56	.347
3812.56	-	3818.32	.348
3818.32	-	3823.82	.349
3823.82	-	3829.25	.350
3829.25	-	3834.75	.351

At Lat	1" Diff in Lat = Ft	1" Diff in Long = Feet
11° 21'	[illegible]	.48002
22'	[illegible]	.47424
23'	80394	.46846
24'	80414'	.46268
25'	80434'	.45690
26'	80454	.45112
27'	80474	.44534
28'	80494	.43945
29'	80514'	.43356
30'	80534	.42767
31'	80554	.42179
32'	80574	.41590
33'	80593	.41001
34'	80613	.40412
35'	80633	.39823
36'	80653	.39234
37'	80671	.38646
38'	80691	.38057
39'	[illegible]	.37468
40'	[illegible]	.36879

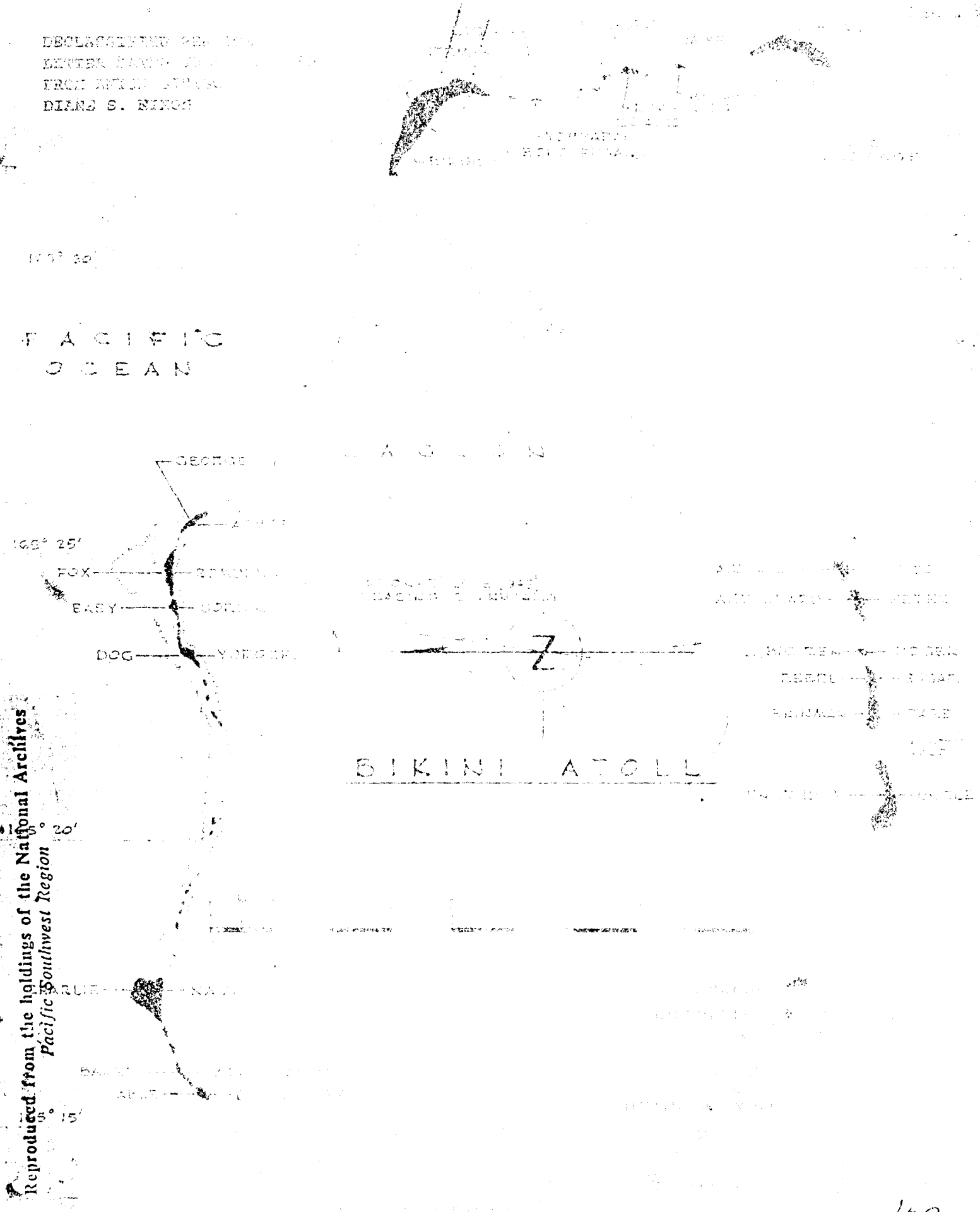
CORRECTION TABLE FOR ALTITUDE CORRECTION

Height (in Ft.) $\times$ 0.5682 = Dist. (in miles) Dist. (in miles) $\times$ Height (in ft.) $\times$ 1.32

MILES

		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0				0.3	0.3	0.4	0.2	0.3	0.4	0.5
1	0.6	0.7	0.8	1.0	1.1	1.2	1.5	1.7	1.9	2.1
2	2.3	2.5	2.7	2.9	3.0	3.2	3.4	3.6	4.1	4.3
3	5.2	5.4	5.6	5.7	5.9	6.1	6.4	7.8	8.3	8.7
4	9.2	9.6	10.0	10.6	10.9	11.3	11.1	12.7	13.2	13.8
5	14.4	14.9	15.5	16.1	16.6	17.2	11.0	18.6	19.3	20.0
6	20.6	21.4	22.1	22.8	23.6	24.3	25.0	25.8	26.6	27.3
7	28.1	28.9	29.7	30.5	31.3	32.1	32.9	33.7	34.6	35.8
8	36.7	37.7	38.6	39.6	40.5	41.5	42.5	43.4	44.5	45.5
9	46.5	47.5	48.6	49.6	50.7	51.7	52.8	53.9	55.1	56.3
10	57.4	58.5	59.7	60.9	62.1	63.3	64.5	65.7	66.9	68.2
11	69.4	70.7	72.0	73.3	74.6	75.9	77.2	78.6	79.9	81.3
12	82.6	84.0	85.4	86.8	88.2	89.6	91.1	92.6	94.0	95.5
13	97.0	98.5	100.0	101.5	103.0	104.6	106.1	107.7	109.3	110.9
14	112.5	114.1	115.8	117.4	119.1	120.8	122.5	124.2	125.9	127.4
15	129.1	130.8	132.6	134.4	136.2	138.0	139.8	141.4	143.3	145.1
16	146.9	148.7	150.6	152.5	154.4	156.3	158.1	160.0	162.0	163.9
17	165.8	167.8	169.8	171.7	173.8	175.8	177.8	179.8	181.8	183.9
18	185.9	188.0	190.0	192.2	194.3	196.4	198.5	200.7	202.8	205.0
19	207.2	209.3	211.5	213.7	216.0	218.2	220.4	222.6	225.0	227.2
20	229.5	231.8	234.2	236.6	239.0	241.4	243.8	246.3	248.8	250.7
21	253.1	255.6	258.2	260.8	263.4	266.0	268.7	271.3	273.9	275.2
22	277.7	280.3	283.0	285.7	288.4	291.2	293.9	296.7	298.3	300.9
23	303.6	306.4	309.2	312.0	314.9	317.8	320.7	323.6	325.0	327.8
24	330.8	333.8	336.8	339.8	342.9	345.9	349.0	352.0	352.9	355.8
25	358.8	361.9	365.0	368.2	371.3	374.5	377.8	381.0	382.6	384.9
26	388.2	391.5	394.8	398.1	401.5	404.9	408.3	411.8	413.7	416.2
27	419.6	423.1	426.6	430.2	433.7	437.3	441.0	444.6	446.8	446.7
28	450.5	454.3	458.1	461.9	465.8	469.7	473.6	477.6	478.6	479.3
29	483.4	487.4	491.5	495.6	499.7	503.9	508.1	512.3	513.0	513.0
30	517.4	521.8	526.2	530.7	535.2	539.7	544.3	548.9	549.4	547.9
31	551.4	556.1	560.8	565.5	570.3	575.1	579.9	584.8	583.9	583.9
32	587.8	592.8	597.8	602.8	607.9	613.0	618.1	623.3	621.4	621.1
33	624.9	630.2	635.5	640.8	646.2	651.6	657.0	662.5	659.4	659.5
34	663.3	668.9	674.5	680.2	685.9	691.6	697.4	703.2	697.4	698.9
35	703.0	707.9	713.9	719.9	725.9	732.0	738.2	744.3	735.4	739.6
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	.8	.9

(0.5738333)



BIKI ATOLL

BENCH MARKS

SITE	STATION	ELEV.	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
ABLE	Tria Sta Able	7.58	1026	18	10/24/53	H & N Disc in 3' Conc Cube	Continuation of Charlie Datum
	P.O.L. #2	7.02	1026	18	10/24/53	H & N Disc in 3' Conc Cube	Continuation of Charlie Datum
BAKER	None						
CHARLIE	Tria Sta Charlie	6.420	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	This Datum is known to be high by approximately 1.5 Feet.
	R.M. #1	3.440	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	Do
	R.M. #2	3.380	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	Do
	R.M. #3	.590	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	Do
[illegible]	[illegible]	[illegible]	1028	30	11/20/53	H & N Disc in 3' Conc Cube	Tide Observations
[illegible]	None						
[illegible]	Tria Sta [illegible]	[illegible]	1028	5	9/ 2/53	H & N Disc in 3' Conc Cube	
	R.M. #1	9.015	1028	5	9/ 2/53	H & N Disc in 1'x2½'x2½' Prismoid	
	R.M. #2	[illegible]	1028	5	9/ 2/53	Do	
	R.M. #3	9.805	1028	5	9/ 2/53	Do	
	[illegible]	[illegible]	1028	[illegible]	9/ 4/53	H & N Disc in 3' Conc Cube	
[illegible]	[illegible]	[illegible]	1055	[illegible]	9/ 6/54	Disc in Concrete	
[illegible]	Tria Sta No How	13.38	1039	29	12/ 7/53	H & N Disc in 3' Conc Cube	
	R.M. #1	12.70	1039	29	12/ 7/53	3"x3" Brass Plate in 15 Gal Drum	Filled with Concrete
	R.M. #2	14.29	1039	29	12/ 7/53	Do	
	R.M. #3	14.36	1039	29	12/ 7/53	Do	
	Tria Sta So How	8.98	1040	25	12/ 7/53	H & N Disc in 3' Conc Cube	
	R.M. #1	8.44	1040	25	12/ 7/53	3"x3" Brass Plate in 15 Gal Drum	Filled with Concrete
	R.M. #2	5.97	1040	25	12/ 7/53	Do	
	R.M. #3	8.47	1040	25	12/ 7/53	Do	
	Tria Sta Kans	10.77	1040	25	12/ 7/53	USN Disc in 10½" Square of Conc	400' NW of No How
	Tria Sta Line	9.94	1040	25	12/ 7/53	Center Punched Mach Bolt in Conc	
ITEM	None						
JIG	Tria Sta Jig	8.34	1039	12	11/ 5/53	H & N Disc in 3' Conc Cube	
KING	None						

BENCH MARKS

			FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
LOVE	Tria Sta Love	11.73	1039	11	11/ 5/53	H & N Disc in 3' Conc Cube	
MIKE	Tria Sta Ebi	9.940	1039	10	11/ 5/53	3/4" Mach Bolt in Hex Conc Block	
	Tria Sta Mike	10.00	1039	11	11/ 5/53	H & N Disc in 3' Conc Cube	
NAN	Tria Sta Enyu (H&N Nan)	10.55	1010	23	6/17/53	H & N Disc Grouted into 9" Square Conc Pillar	
	Mon Nile	11.44	1010	23	6/17/53	H & N Disc in 3' Conc Cube	
	Mon Neon	[illegible]	1039	15	11/10/53	H & N Disc in 3' Conc Cube	
	Mon Piget	[illegible]	1039	14	11/10/53	H & N Disc in 3' Conc Cube	
	[illegible]	[illegible]	Unknown			H & N Disc in 15" Square Conc Block	
	[illegible]	[illegible]	Unknown			Bronze Plug in Collar Set in 15" Square Conc Block	
[illegible]	Tria Sta [illegible]	10.153	1038	5	9/26/53	H & N Disc in 3' Conc Cube	
	B.M. #1	7.278	1038	5	9/26/53	H & N Disc in Conc Filled 50 Gal Barrel	
	B.M. #2	7.457	1038	5	9/26/53	H & N Disc on Conc Filled 15 Gal Barrel	
	Tria Sta [illegible]	[illegible]	1029	20	8/26/53	H & N Disc in 30" Dia Conc Block	
	Mon Enyx	[illegible]	[illegible]	14	8/22/53	H & N Disc in Conc Mon	
[illegible]	Mon Fox	[illegible]	[illegible]	[illegible]	[illegible]/53	H & N Disc in Conc Mon	
	Mon Tiger	[illegible]	[illegible]	[illegible]	[illegible]/53	H & N Disc in [illegible] Conc [illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	Mon Lion	[illegible]	[illegible]	13	8/22/53	H & N Disc in Conc Mon	
	Mon Bear	[illegible]	1029	13	8/22/53	H & N Disc in Conc Mon	
[illegible]	Mon Zebra	[illegible]	1029	3	7/21/53	H & N Disc in Conc Mon	
	Tria Sta Salt	9.600	1036	6	10/21/53	H & N Disc in 3' Conc Cube	
	R.M. #1	7.757	1036	6	10/21/53	H & N Disc in Half Barrel of Conc	
	R.M. #2	7.135	1036	6	10/21/53	Do	
	R.M. #3	7.709	1036	6	10/21/53	Do	
	Station 2220 Bench Marks						
	B.M. #2	8.528	1046	15	10/29/53	All Baseline Bench Marks consist of 2" Dia Pipe driven to refusal with a 3"x3"x3/8" Piece of Iron with a $\frac{1}{2}$" Dia by $\frac{1}{4}$" High Brass knob on it, welded to the pipe.	
	B.M. #3	9.352	1046	15	10/29/53		
	B.M. #4	9.785	1046	15	10/29/53		
	B.M. #5	10.299	1046	15	10/29/53		
	B.M. #6	10.560	1046	15	10/29/53		
	B.M. #7	10.958	1046	15	10/29/53		

BIKINI ATOLL

BENCH MARKS

FARR	Station 2220 Bench Marks					
	B.M. #8	11.376	1046	15	10/29/53	All Baseline Bench Marks consist
	B.M. #9	11.772	1046	15	10/29/53	of 2" Dia Pipe driven to refusal
	B.M. #10	11.825	1046	15	10/29/53	with a 3"x3"x3/8" Piece of Iron
	B.M. #11	10.782	1046	15	10/29/53	with a ½" Dia by ½" High Brass
	B.M. #12	12.365	1046	15	10/29/53	knob on it, welded to the pipe
[illegible]	[illegible]	[illegible]	[illegible]	17	11/11/53	H & N Disc in [illegible] Conc Cube
[illegible]	[illegible]	[illegible]	[illegible]	17	11/11/53	H & N Disc in Half Barrel of Concrete
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11/11/53	Do
[illegible]	[illegible]	[illegible]	[illegible]	17	11/11/53	Do
[illegible]	[illegible]	8.29	1036	17	11/11/53	USN Survey Disc in 12" Block of Concrete
	(USN Farr)					
	B.M. #1	6.89	1036	17	11/11/53	H & N Disc in Concrete
	B.M. #2	[illegible]	1036	17	11/11/53	H & N Disc in Conc filled Half Barrel
	B.M. #3	[illegible]	[illegible]	[illegible]	11/11/53	Do
[illegible]	[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12/ 3/53	Bolt in 10" Square Conc Block
	[illegible]	[illegible]	1036	27	12/ 3/53	H & N Disc in 3' Conc Cube
	B.M. #1	[illegible]	1036	27	12/ 3/53	H & N Disc in Conc filled Half Barrel
	B.M. #2	[illegible]	1036	27	12/ 3/53	Do
[illegible]	[illegible]	[illegible]	1049	5	12/26/53	H & N Disc in Conc Mon
	(USN Oruk)					
	R.M. #1	6.90	1049	5	12/26/53	H & N Disc in Conc Filled Half Barrel
	R.M. #2	6.26	1049	5	12/26/53	Do
	R.M. #3	7.155	1049	5	12/26/53	Do
ALFA	Tria Sta Alfa	9.42	1049	8	12/28/53	USN Survey Disc in 10" Block of Concrete
	(USN Boku)					
	R.M. #1	6.57	1049	8	12/28/53	H & N Disc in Conc Filled Half Barrel
	R.M. #2	6.35	1049	8	12/28/53	Do
	R.M. #3	6.67	1049	8	12/28/53	Do
BRAVO	Tria Sta Bravo	6.76	1036	30	12/ 9/53	USN Survey Disc in Conc Block
	(USN Boro)					
	R.M. #1	5.14	1036	30	12/ 9/53	H & N Disc in Conc Filled Half Barrel
	R.M. #2	4.13	1036	30	12/ 9/53	Do
	R.M. #3	4.96	1036	30	12/ 9/53	Do

TIDE TABLE

BIKINI Atoll, MARSHALL Islands

1957

This [illegible] is [illegible] from [illegible] Bureau, Central and Western Pacific Ocean, and Tarawa Canton, Fanning, and [illegible] Charts by the U.S. Department of Commerce, Coast and Geodetic Survey.

Data, [illegible] is obtained by the [illegible] addition or [illegible] "Heights are reckoned from the datum of soundings on the [illegible] charts of the locality under [illegible] reduction to "low water datum" for Bikini Atoll, Marshall Islands.

The meters are counted in Bikini Atoll, [illegible] 180 degrees east. The following [illegible] phases in [illegible] time differences and ranges:

	Time		Range	
	High	Low	High	Low
Bikini Atoll	[illegible]	[illegible]	[illegible]	[illegible]

Range is the difference between successive [illegible], i.e., between a high and a low or a low and a high. Mean range is the average range of all tides in the year. Spring range is the average range occurring twice a month, Spring tides are [illegible] (opposite to the sun) when the [illegible] and the moon are [illegible].

The values in this [illegible] are based on average weather conditions. Unusual weather, particularly high winds [illegible] can cause [illegible] normal, affect both the [illegible] and the heights.

Each side of the chart has a graphic [illegible] and heights of high and low. This can be interpolated for the [illegible] printed in the [illegible]. The water level on the [illegible] is [illegible] than that of the [illegible], the difference varying from [illegible] to [illegible].

[illegible]

[illegible] & Marine, Inc.,
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0401	H 4.4	9	0021	L 1.6	17	0316	H 5.0	25	----	----
Tu	0952	L 0.8	W	0742	H 5.2	Th	0950	L 0.4	F	0504	L 2.1
	1613	H 5.6		1443	L 2.1		1610	H 6.3		1015	H 3.9
	2240	L 0.6		2056	H 5.7		2301	L-0.3		1630	L 2.2
2	0439	H 4.5	10	0051	L 1.6	18	0349	H 5.1	26	0102	L 3.2
W	1031	L 0.7	Th	0826	H 5.8	F	1036	L 0.2	Sa	0649	L 2.1
	1643	H 5.6		1649	L 1.5		1719	H 6.1		1035	H 4.2
	2309	L 0.4		2330	H 5.7		2348	L 0.0		2032	L 1.8
3	0504	H 4.6	11	----	----	19	0424	H 5.0	27	0111	H 3.5
Th	1056	L 0.7	F	0021	L 1.2	Sa	1120	L 0.0	Su	0753	L 1.8
	1715	H 5.6		1347	H 6.0		1811	H 5.8		1424	H 4.5
	2338	L 0.3		1945	L 2.1		----	----		2100	L 1.4
4	0535	H 4.5	12	0041	H 5.4	20	0526	L 0.2	28	0151	H 3.9
F	1126	L 0.8	Sa	0609	L 1.8	Su	0621	H 5.0	M	0836	L 1.4
	1745	H 5.4		1505	H 5.9		1922	L 0.6		1500	H 5.0
	----	----		2044	L 2.4		1930	H 5.3		2130	L 1.0
5	0007	L 0.6	13	0054	H 5.5	21	0508	L 0.6	29	0224	H 4.2
Sa	0600	H 4.6	Su	0703	L 1.7	M	0917	H 4.7	Tu	0912	L 1.1
	1157	L 1.0		1408	H 4.9		1614	L 1.1		1531	H 5.3
	1813	H 5.2		2053	L 2.6		2044	H 4.8		2157	L 0.7
6	0036	L 0.8	14	0129	H 4.9	22	0640	L 1.4	30	0552	H 4.5
Su	0647	H 4.5	M	0859	L 1.8	Tu	0722	H 4.4	W	0946	L 0.9
	1238	L 1.0		1446	H 4.6		1453	L 1.4		1602	H 5.5
	1854	H 4.9		2116	L 2.6		2307	H 4.7		2224	L 0.3
7	0106	L 1.0	15	0214	H 4.5	23	0826	L 1.5	31	0721	H 4.7
M	0715	H 4.4	Tu	0959	L 0.2	W	0953	H 4.5	Th	1033	L 0.7
	1304	L 1.3		1622	H 4.3		1708	L 1.3		1729	H 5.6
	1934	H 4.7		2158	L 2.7		2352	H 4.6		2350	L 0.4
8	0140	L 1.2	16	0305	H 4.3	24	0937	L 1.2			
Tu	0750	H 4.4	W	0953	L 0.3	Th	1047	H 4.8			
	1347	L 1.3		1650	H 4.3		1721	L 1.4			
	1950	H 4.7		2256	L 2.6		2345	H 5.0			

DAY	SUNRISE	SUNSET
1	0719	1646
15	0720	1653
23	0723	1716
31	0722	1738

JUNEAU AREA, ALASKA AND CANADA

TIDE TABLE FOR JANUARY 1957

NORTH LATITUDE AND WEST LONGITUDE CORRECTIONS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0449	H 4.9	9	0540	L 2.0	17	0235	H 5.6	25	0211	H 5.4
F	1044	L 0.4	Su	1049	H 4.9	Th	1149	L 0.3	F	0745	L 2.1
	1657	H 5.4		1700	L 1.5		1743	H 5.8		1409	H 4.4
	2316	L 0.4		1955	H 5.2		----	----		2045	L 1.6
2	0516	H 5.0	10	----	----	18	0018	L 1.2	26	0242	H 3.9
Sa	1113	L 0.4	Su	0620	L 2.1	M	0531	H 5.5	Sa	0859	L 1.7
	1723	H 5.4		1134	H 4.8		1146	L 0.4		1444	H 4.6
	2342	L 0.4		1900	L 1.8		1759	H 5.3		2110	L 1.6
3	----	----	11	0052	H 5.6	19	0300	L 0.6	27	0310	H 4.3
Su	0543	H 5.0	M	0704	L 1.7	Tu	0918	H 5.2	M	0937	L 1.3
	1141	L 0.4		1245	H 4.8		1256	L 0.5		1516	H 5.1
	1750	H 5.2		2008	L 1.5		1856	H 5.4		2145	L 1.2
4	0006	L 0.4	12	0128	H 4.3	20	0008	L 1.0	28	0235	H 4.7
M	0611	H 4.7	Tu	0804	L 2.2	W	0924	H 4.9	Th	0932	L 1.0
	1210	L 0.4		1426	H 5.4		1323	H 1.5		1542	H 5.4
	1818	H 5.0		2102	L 0.7		1956	H 5.2		2149	L 1.6
5	0032	L 0.4	13	0204	H 4.6	21	0056	L 1.5			
Tu	0639	H 4.8	W	0850	L 0.7	Th	0948	H 4.8			
	1241	L 1.0		1502	H 5.6		1404	L 2.0			
	1842	H 4.9		2146	L 0.9		2046	H 5.6			
6	0059	L 1.0	14	0246	H 4.4	22	0145	L 2.0			
W	0712	H 4.6	Th	0854	L 0.9	F	0958	H 3.9			
	1316	L 1.4		1545	H 6.1		1420	L 2.5			
	1916	H 4.7		2229	L 0.9		2116	H 5.0			
7	0131	L 1.5	15	0328	H 4.4	23	0233	L 2.4			
Th	0752	H 4.5	F	1002	L 0.8	Sa	1114	H 5.7			
	1404	L 1.9		1603	H 6.3		1504	L 2.4			
	1952	H 4.6		2254	L 0.9		----	----			
8	0214	L 1.9	16	0422	H 4.6	24	0408	H 3.8			
F	0854	H 4.3	Sa	1104	L 0.8	Su	1208	L 2.5			
	1523	L 2.4		1703	H 6.3		1556	H 6.0			
	2109	H 4.5		2339	L 0.9		2247	L 2.0			

DAY	SUNRISE	SUNSET
1	0721	1553
15	0720	1639
31	0715	1725

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0401	H 5.6	9	0836	L 1.7	17	0526	H 6.0	25	0051	H 5.1
F	1000	L 0.3	Sa	0946	H 4.4	Su	1042	L 0.0	M	0647	L 0.8
	1608	H 5.6		1452	H 5.2		1703	H 5.7		1242	H 4.9
	2232	L 0.4		2040	L 2.4		2332	L 0.1		1935	L 1.1
2	0428	H 5.5	10	0542	L 2.1	18	0216	L 6.0	26	0147	H 4.6
Sa	1037	L 0.2	Su	0950	H 4.3	M	1139	L 0.3	Tu	0725	L 1.4
	1654	H 5.6		1542	L 2.3		1757	H 5.6		1336	H 4.2
	2247	L 0.4		2135	H 5.2		2347	L 0.3		2020	L 1.7
3	0451	H 5.4	11	----	----	19	0313	H 5.8	27	0218	H 4.2
Su	1054	L 0.7	M	0001	L 2.9	Tu	1219	L 0.5	W	0809	L 1.6
	1700	H 5.6		1646	H 4.3		1852	H 5.7		1426	H 4.6
	2311	L 0.4		1908	L 3.9		----	----		2056	L 1.4
4	0516	H 5.4	12	0112	L 3.7	20	0359	H 5.7	28	0243	H 4.3
M	1128	L 0.5	Tu	1708	L 3.9	W	0916	H 5.5	Th	0852	L 1.8
	1726	H 5.4		1956	H 4.2		1443	L 0.9		1446	H 4.9
	2339	L 0.4		1959	L 3.8		1948	H 4.2		2108	L 2.0
5	0542	H 5.4	13	0305	L 4.3	21	0434	H 5.4	29	0303	H 4.9
Tu	1150	L 0.7	W	0912	L 3.9	Th	0958	L 1.1	F	0900	L 1.1
	1752	H 5.1		1756	H 5.2		1516	H 5.4		1513	H 5.2
	2359	L 0.7		2054	L 4.8		2033	H 4.1		2145	L 1.6
6	----	-----	14	0438	H 4.9	22	0456	L 1.6	30	0336	H 4.2
W	0610	H 5.2	Th	0946	L 3.7	F	0535	H 5.6	Su	0938	L 1.5
	1221	L 0.9		1851	H 5.2		1553	L 0.9		1540	H 4.6
	1820	H 4.8		2106	L 3.5		2107	H 3.9		2150	L 1.9
7	0026	L 0.9	15	0506	H 5.4	23	0533	L 2.1	31	0546	H 4.5
Th	0642	H 5.2	F	0939	L 3.5	Sa	0712	H 5.2		1008	L 1.3
	1256	L 1.5		1949	H 5.0		1549	L 1.4		1548	H 4.5
	1852	H 4.4		2136	L 3.3		2202	H 3.9		2214	L 1.5
8	0056	L 1.3	16	0601	H 5.2	24	0617	L 2.6			
F	0720	H 4.8	Sa	1010	L 3.6	Su	0836	H 5.2			
	1321	L 1.7		1958	H 4.8		1557	L 2.1			
	1932	H 5.0		2230	L 3.5		----	----			

DAY	SUNRISE	SUNSET
1	0713	1645
15	0707	1709
31	0701	1733

[illegible] STORM, MARCH 1-[illegible]

TIDE TABLE FOR MAY 1957

[illegible] & HARBOR, CAL., [illegible]-CONSOLIDATED

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0420	H 5.7	9	0645	H 2.4	17	0722	H 6.0	25	0459	H 5.7
M	1032	L 0.4	Th	1122	L 0.3	F	1427	L 0.6	Sa	1021	L 0.4
	1643	H 5.4		1647	H 5.8		2038	H 5.8		1626	H 5.2
	2258	L 0.6		--	--		2354	L 0.2		2243	L 0.5
2	0457	H 5.8	10	0004	H 3.9	18	--	--	26	0535	H 5.8
Tu	1114	L 0.3	F	0641	L 2.0	Su	0738	H 6.7	M	0959	L 0.3
	1730	H 5.6		1240	H 6.6		1516	L 1.0		1405	H 5.4
	2344	L 0.7		1912	L 2.4		2110	H 6.5		2313	L 0.5
3	0538	H 5.8	11	0847	L 2.6	19	0102	L 1.2	27	0633	H 5.9
W	1154	L 0.6	Sa	0926	H 7.4	M	0756	H 6.3	Tu	0956	L 0.4
	1758	H 5.3		1351	H 6.3		1358	L 0.9		1439	H 5.2
	2354	L 0.7		2001	L 2.2		1942	H 6.4		2014	L 0.7
4	0618	H 5.7	12	0013	H 5.1	20	0234	L 1.6	28	0730	H 6.0
Th	1237	L 0.9	Su	0959	L 0.9	Tu	0918	H 6.5	Th	0614	L 0.4
	1827	H 5.2		1440	H 5.8		1537	L 0.8		1531	H 5.4
	-----	-----		2052	L 0.6		2114	H 6.3		2114	L 0.6
5	0002	L 0.9	13	0100	H 5.6	21	0331	L 1.6	29	0328	H 6.1
F	0657	H 5.6	Su	1024	L 0.5	M	0954	H 6.6	M	0744	L 0.3
	1320	L 0.7		1529	H 6.0		1612	L 0.8		1613	H 5.6
	1859	H 5.4		2129	L 0.4		2152	H 6.4		2149	L 0.7
6	0045	L 0.8	14	0200	H 6.0	22	0427	L 1.5	30	0757	H 6.3
Sa	0731	H 5.8	Su	0751	L 0.3	M	0951	H 6.9	Tu	1015	L 0.4
	1359	L 0.6		1557	H 6.6		1707	L 0.6		1643	H 5.8
	1935	H 5.5		2208	L 0.2		2254	H 6.7		2211	L 0.5
7	0113	L 0.8	15	0248	H 6.3	23	0523	L 1.4			
Su	0756	H 6.0	M	1051	L 0.2	Th	1047	H 7.3			
	1441	L 0.6		1642	H 6.9		1804	L 0.4			
	2014	H 5.6		2256	L 0.2		--	--			
8	0201	L 0.7	16	0327	H 6.5	24	0619	L 1.3			
M	0829	H 6.2	Th	1127	L 0.2	F	1142	H 7.6			
	1523	L 0.6		1726	H 7.1		1858	L 0.3			
	2054	H 5.8		2336	L 0.2		1929	H 7.9			

DAY	SUNRISE	SUNSET
1	0655	1902
15	0629	1929
31	0603	1956

[illegible] TIDES

[illegible] PACIFIC BAY, [illegible] 1957

[illegible] [illegible], [illegible], [illegible] CORRECTIONS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0428	H 6.4	9	0457	H 7.3	17	0442	H 6.7	25	0114	H 4.[illegible]
W	1048	L 0.4	Sa	0854	L 0.0	F	1043	L 1.0	Su	0735	L [illegible]
	1645	H [illegible]		1533	H 4.6		1537	H 6.4		1316	H 4.[illegible]
	2254	L 0.7		2152	L 1.6		2348	L 1.8		1906	L 1.[illegible]
2	0458	H 6.6	10	0010	H 4.6	18	0306	H 6.4	26	0143	H 4.[illegible]
Th	1142	L 0.6	Su	0722	L 1.6	Sa	1041	L 1.0	Su	0810	L 1.[illegible]
	1719	H 6.4		1506	H 4.7		1734	H 6.1		1402	H 4.4
	2314	L 0.6		2041	L 1.5		---	---		2036	L 1.[illegible]
3	0534	H 6.6	11	0152	H 5.4	19	0353	H 7.6	27	0228	H 5.[illegible]
F	1201	L 0.5	Su	0834	L 1.2	Su	0833	L 1.0	M	0619	L 1.[illegible]
	1756	H 6.3		1636	H 4.9		1812	H 6.1		1641	H 4.[illegible]
	2349	L 1.1		2302	L 0.9		2306	H 8.9		2058	L 1.[illegible]
4	---	---	12	0240	H 6.6	20	0358	H 7.0	28	0306	H 5.[illegible]
Sa	0612	H 6.6	M	0859	L 0.8	M	0854	L 1.6	Tu	0654	L 1.[illegible]
	1244	L 1.1		1758	H 5.0		1902	H 6.2		1737	H 4.[illegible]
	1829	H 6.3		2403	L 0.7		2400	L 0.6		2115	L 0.[illegible]
5	0029	L 1.6	13	0356	H 5.9	21	0435	H 7.0	29	0336	H 5.[illegible]
Su	0657	H 6.6	M	0958	L 0.6	Tu	0945	L 1.2	W	1000	L 0.[illegible]
	1339	L 1.1		1836	H 5.0		1948	H 6.1		1756	H 4.[illegible]
	1921	H 6.4		2436	L 0.6		2436	H 8.6		2150	L 0.[illegible]
6	0119	L 1.6	14	0426	H 6.3	22	0440	H 6.6	30	0431	H 6.[illegible]
M	0739	H 6.5	Tu	1037	L 0.5	W	0945	H 8.9	Su	1008	L 0.[illegible]
	1442	L 1.0		1856	H 5.0		2036	L 0.7		1828	H 4.[illegible]
	2018	H 6.7		2508	L 0.6		2436	L 0.6		2027	L 0.[illegible]
7	0205	L 1.6	15	0458	H 6.5	23	0440	H 6.4	31	0448	H 6.[illegible]
Tu	0821	H 6.5	W	1058	L 0.6	Th	1040	H 8.8	F	1132	L 0.[illegible]
	1601	L 1.0		1907	H 5.0		2132	L 0.8		1918	H 6.[illegible]
	2120	H 6.7		2534	L 0.6		---	---		2108	L 0.[illegible]
8	0249	L 1.6	16	0530	H 6.6	24	0532	L 1.0			
W	1058	H 6.5	Th	1128	L 0.7	F	0556	H [illegible]			
	1746	L 1.0		1951	H 5.1		1224	H 8.0			
	---	---		2614	L 1.0		2342	L 1.6			

DAY	SUNRISE	SUNSET
1	0629	1933
15	0636	1939
23	0617	1916
31	0559	1859

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	2527	H 6.0	9	0123	H 4.9	17	0031	H 1.4	25	0059	H 5.1
Sa	1157	L 0.7	Su	0758	L 1.5	M	0647	L 2.2	Tu	0848	L 2.4
	1751	H 4.6		1305	H 4.8		1302	H 3.1		1552	H 4.7
	2345	L 3.0		1954	L 1.3		1958	L 1.3		2213	L 2.2
2	2409	H 5.6	10	0230	H 5.3	18	0101	H 1.7	26	0142	H 5.4
Su	1241	L 0.9	M	0847	L 1.2	Tu	0701	H 4.0	W	0830	L 2.1
	1837	H 4.6		1431	H 4.6		1346	L 3.1		1554	H 4.4
	----	----		2026	L 1.3		2021	L 1.0		2046	L 2.1
3	0029	L 3.2	11	0300	H 5.6	19	0151	H 1.0	27	0220	H 5.2
M	0454	H 5.4	Tu	0939	L 0.9	W	0740	H 4.6	Th	0910	L 1.8
	1333	L 1.1		1532	H 4.6		1427	L 2.7		1554	H 4.4
	1921	H 5.2		2114	L 0.9		2035	L 1.5		2137	L 2.1
4	0121	L 2.6	12	0330	H 5.8	20	0219	H 2.3	28	0253	H 6.1
Tu	0745	H 5.0	W	1007	L 0.8	Th	0757	H 4.5	F	0946	L 1.5
	1424	L 1.4		1629	H 4.6		1510	L 2.2		1653	H 4.4
	2034	H 4.7		2151	L 0.9		2109	L 1.8		2209	L 2.
5	0227	L 2.9	13	0358	H 5.9	21	0246	H 2.6	29	0320	H 6.1
W	0853	H 4.6	Th	1052	L 0.7	F	0830	H 4.6	Sa	1020	L 0.9
	1535	L 1.6		1654	H 4.6		1547	L 2.0		1740	H 4.4
	2154	H 4.8		2224	L 0.9		2139	H 2.0		2238	L 2.
6	0258	L 3.0	14	0427	H 5.9	22	0311	H 2.6	30	0350	H 6.
Th	1011	H 4.7	F	1114	L 0.8	Sa	0859	H 4.7	Su	1048	L 0.8
	1653	L 1.7		1709	H 4.6		1621	L 1.9		1817	H 4.4
	2322	H 4.9		2253	L 1.0		2211	L 1.7		2311	L 2.
7	0329	L 3.1	15	0501	H 5.7	23	0331	H 2.2			
F	1140	H 4.7	Sa	1140	L 0.9	Su	0851	H 4.8			
	1737	L 1.6		1744	H 4.6		1652	L 1.7			
	----	----		2334	L 1.1		1656	H 4.6			
8	0359	H 4.1	16	0544	H 5.5	24	0352	H 4.5			
Sa	1209	L 3.3	Su	1223	L 1.0	M	0903	L 1.4			
	1815	H 4.2		1820	H 4.5		1730	H 4.2			
	1736	L 1.6					1918	L 1.5			

DAY	PUBLIC	ADMIN
2	0038	1220
15	0654	1352
25	0636	1325

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	1601	H 5.9	9	0002	H 5.0	17	0228	H 4.8	25	0445	H 5.3
M	1222	L 0.9	Su	0830	L 1.4	W	0859	H 5.0	Th	0937	L 1.3
	1838	H 4.9		1429	H 4.0		1502	L 1.1		1603	H 4.4
	----	-----		2048	L 1.8		2105	H 4.8		2216	L 1.7
2	0126	L 0.9	10	0530	H 5.3	18	0328	L 1.6	26	0535	H 5.6
Tu	0944	H 5.6	M	0932	L 1.3	Su	0936	H 4.7	F	1037	L 0.8
	1611	L 0.8		1552	H 4.3		1554	L 1.4		1654	H 4.3
	1916	H 4.6		2134	L 1.9		2146	H 4.5		2159	L 0.4
3	0213	L 0.8	11	0627	H 5.6	19	0357	L 1.9	27	0549	H 6.1
W	0936	H 5.1	Su	0954	L 0.9	M	0959	H 4.8	Sa	1036	L 0.3
	1657	L 1.0		1640	H 4.3		1626	L 1.6		1715	H 5.1
	2009	H 4.4		2240	L 1.9		2227	H 4.2		2316	L 0.4
4	0259	L 1.6	12	0709	H 5.7	20	0433	L 2.2	28	0620	H 6.5
Th	0921	H 4.7	M	1018	L 0.8	Tu	0744	H 4.9	Su	1043	L 0.1
	1750	L 1.6		1729	H 4.6		1734	L 1.9		1743	H 5.0
	2211	H 4.3		2345	L 0.9		2328	H 4.3		2350	L 0.5
5	0321	L 2.0	13	0753	H 5.8	21	0503	L 2.4	29	0703	H 6.4
F	0926	H 4.5	Su	1100	L 0.7	Tu	0536	H 5.0	M	1130	L 0.1
	1856	L 1.8		1824	H 4.7		1834	L 2.0		1821	H 5.1
	2336	H 4.2		0000	L 0.9		0014	H 4.2		0032	L 0.5
6	0538	L 2.0	14	0900	H 5.7	22	0618	L 2.2	30	0747	H 6.3
Sa	1052	H 5.0	M	1142	L 0.7	W	1140	H 5.2	Th	1206	L 0.1
	1714	L 1.5		1926	H 4.7		1934	L 2.0		1910	H 5.1
	2359	H 4.3		0040	L 0.9					----	-----
7	0639	L 2.1	15	0036	H 5.6	23	0044	H 4.5	31	0113	L 0.4
Su	1226	H 5.2	Tu	1240	L 0.8	Th	0717	L 2.0	F	0826	H 5.9
	1833	L 1.3		2026	H 4.7		1244	H 5.4		1943	L 0.8
	----	-----		0138	L 1.0		0152	L 1.8		1950	H 5.7
8	0117	H 4.6	16	0654	H 5.5	24	0146	H 4.8			
M	0752	L 1.8	Tu	1337	L 0.9	W	0815	L 1.6			
	1340	H 5.8		1959	H 4.7		1349	H 5.8			
	1934	L 1.4		----	----		1957	L 1.4			

DAY	HEIGHT	HEIGHT
1	0653	1936
16	0941	1957
26	0854	1920

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0356	L 1.0	9	0716	H 5.8	17	1532	L 0.6	25	0134	H 6.2
Th	0735	H 5.2	F	0859	L 3.0	Su	1703	H 4.4	Su	0805	L 0.2
	1322	L 1.0		1247	H 4.6		2137	L 1.4		1537	H 5.3
	1935	H 4.8		2030	L 1.0					2030	L 0.2
2	0446	L 1.4	10	0745	H 5.6	18	0027	L 1.2	26	0213	H 6.2
F	0748	H 4.8	Sa	1009	L 0.7	Su	0758	H 4.8	M	0900	L 0.0
	1404	L 1.4		1326	H 4.8		1342	L 1.0		1653	H 5.4
	2014	H 4.6		2102	L 0.8		1958	H 4.8		2256	L 0.2
3	0541	L 1.2	11	0841	H 5.7	19	0123	L 0.8	27	0250	H 6.2
Sa	0839	H 5.0	Su	1056	L 0.6	M	0852	H 4.8	Tu	1000	L 0.2
	1457	L 1.0		1354	H 5.0		1435	L 0.8		1702	H 5.6
	2113	H 4.8		1948	L 0.7		2044	H 4.8		2357	L 0.2
4	0617	L 0.8	12	0842	H 5.7	20	0215	L 0.6	28	0327	H 6.2
Su	1001	H 5.4	M	1101	L 0.4	Tu	0946	H 4.8	W	1138	L 0.2
	1613	L 0.6		1408	H 5.2		1527	L 0.6		1743	H 5.6
	2232	H 4.8		2001	L 0.7		2135	H 4.8		2354	L 0.2
5	0638	L 0.6	13	0910	H 5.6	21	0308	L 0.4	29	0352	H 6.2
M	1214	H 5.8	Tu	1134	L 0.4	W	1038	H 4.8	Th	1221	L 0.2
	1726	L 0.4		1429	H 5.3		1618	L 0.4		1823	H 5.6
	----	----		2030	L 0.8		----	----		----	----
6	0159	H 4.8	14	0937	H 5.4	22	0346	L 0.4	30	0435	L 0.
Tu	0753	L 0.6	W	1157	L 0.7	Th	0932	H 4.8	F	0959	H 5.
	1342	H 5.6		1429	H 5.3		1702	L 0.6		1943	L 0.
	1927	L 0.8		2059	L 1.0		2157	H 4.6		2021	H 5.
7	0159	H 4.7	15	0958	H 5.2	23	0422	L 0.6	31	0417	L 0.
W	0839	L 0.6	Th	1217	L 0.9	F	0951	H 4.6		0945	H 4.
	1431	H 5.4		1606	H 4.9		1740	L 0.8		2019	L 1.
	2017	L 1.0		---	---		2300	H 4.6		1955	H 4.
8	0241	H 5.0	16	0955	L 0.8	24	0015	H 5.2			
Th	0910	L 0.8	F	0955	H 4.8	Sa	0852	L 0.8			
	1502	H 4.8		1746	L 1.0		1336	H 4.8			
	2106	L 1.2		1956	H 4.7		2040	L 0.8			

DAY	MORNING	EVENING
1	0646	1922
15	0647	1918
31	0603	1853

BIKINI ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR SEPTEMBER 1957

[illegible] CORRECTIONS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0209	L 1.9	9	0551	H 5.6	17	0627	L 2.2	25	0459	H 6.1
Su	0757	H 5.8	M	1052	L 0.6	Tu	0851	H 5.6	W	1057	L 0.1
	1359	L 2.0		1608	H 5.4		1407	L 2.2		1646	H 6.1
	[illegible]	H 4.2		2212	L 0.6		2105	H 4.3		2300	L 0.1
2	[illegible]	L 2.4	10	0457	H 5.6	18	0530	L 2.4	26	0505	H 5.6
M	[illegible]	H 5.2	Tu	1059	L 0.5	W	[illegible]	H 5.2	Th	[illegible]	L 0.[illegible]
	[illegible]	L 2.4		1634	H 5.5		[illegible]	L 2.4		1721	H 6.[illegible]
	[illegible]	H 4.9		2240	L 0.6		2331	H 4.2		2330	L 0.[illegible]
3	0324	L 2.4	11	0543	H 5.5	19	0608	L 2.0	27	0542	H 5.[illegible]
Tu	[illegible]	H 5.0	W	1203	L 0.4	Th	1259	H 5.6	F	1142	L 0.[illegible]
	1756	L 2.6		[illegible]	H 5.5		1830	L 2.3		1756	H 5.[illegible]
	----	----		2307	L 0.6					----	----
4	[illegible]	H 4.3	12	0509	H 5.7	20	0054	H 4.6	28	0015	L 0.[illegible]
W	[illegible]	L 2.0	Th	1117	L 0.6	F	[illegible]	L 2.5	Sa	0607	H 4.[illegible]
	1444	H 3.6		1726	H 5.3		1329	H 4.8		1242	L 1.[illegible]
	1923	L 2.[illegible]		2335	L 0.8		1950	L 1.5		1830	H 5.[illegible]
5	[illegible]	H 4.4	13	[illegible]	H 5.3	21	0150	H 5.3	29	0052	L 1.1
Th	[illegible]	L 1.6	F	1145	L 0.8	Sa	0807	L 1.0	Su	0648	H 4.[illegible]
	[illegible]	H 4.0		1755	H 5.4		[illegible]	H 4.8		1242	L 1.[illegible]
	[illegible]	L 1.8					[illegible]	L 0.9		1909	H 4.[illegible]
6	[illegible]	H 4.8	14	0006	L 1.0	22	0246	H 5.6	30	0142	L 1.[illegible]
F	[illegible]	L 1.3	Sa	[illegible]	H 4.8	Su	0854	L 0.5	M	0727	H 3.7
	1450	H 4.3		1206	L 1.0		1510	H 5.4		1327	L 2.0
	[illegible]	L 1.4		1820	H 5.1		2105	L 0.7		1958	H 4.[illegible]
7	[illegible]	H 5.0	15	0038	L 1.[illegible]	23	0315	H 5.9			
Sa	[illegible]	L 1.0	Su	[illegible]	H 4.4	M	[illegible]	L 0.5			
	[illegible]	H 4.8		1259	L 1.[illegible]		1536	H 5.8			
	[illegible]	L 1.1		1856	H 4.9		2115	L 0.2			
8	[illegible]	H 5.4	16	[illegible]	L 1.7	24	0355	H 6.0			
Su	[illegible]	L 0.7	M	[illegible]	H 5.9	Tu	1006	L 0.0			
	[illegible]	H 5.1		[illegible]	L 1.8		1615	H 6.3			
	[illegible]	L 0.8		1954	H 4.5		2225	L 0.0			

DAY	SUNRISE	SUNSET
5	0622	1907
15	0617	1900
25	0617	1852

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0257	L 2.0	9	0310	H 5.3	17	0555	L 0.3	25	0441	H 5.3
Tu	0836	H 3.2	W	0926	L 0.4	Th	1050	H 4.8	M	1041	L 0.4
	1412	L 2.5		1642	H 5.4		1545	L 2.4		1701	H 6.1
	2133	H 3.5		2256	L 0.6		2??	H 4.3		2?16	L 0.4
2	0540	L 2.4	10	0004	H 5.3	18	0?47	L 1.7	26	0517	H 5.0
W	1202	H 3.3	Th	1047	L 0.5	F	1?47	H 5.2	Tu	1113	L 0.6
	1721	L 2.0		1708	H 5.8		1?07	L 2.?		1715	H 5.?
	----	-----		2?27	L 0.4					----	-----
3	0001	H 3.9	11	0419	L 5.2	19	0??	L 4.4	27	0000	L 0.7
Th	0711	L 0.1	F	1046	L 0.6	Sa	0?04	H 5.4	Th	0554	H 4.6
	1327	H 3.4		1?09	H 5.8		1?47	H 2.?		1447	L 1.?
	1907	L 2.6		2?46	L 0.7		1?05	L 1.?		1310	H 5.4
4	0115	H 4.3	12	0419	H 5.8	20	0?47	L 4.9	28	0?39	L 1.2
F	0749	L 1.7	Sa	1?47	L 0.8	Su	0?47	H 5.0	F	0?3?	H 4.1
	1400	H 4.0		1?38	H 5.6		1?0?	H 5.0		1?17	L 1.?
	1952	L 2.0		2?3?	L 0.9		1?0?	L 1.?		1?4?	H 4.9
5	0155	H 4.2	13	0?40	H 4.7	21	0?1?	H 5.?	29	0?1?	L 1.?
Sa	0817	L 1.4	Su	1?3?	L 1.0	M	0?2?	L 0.?	Tu	0711	H 5.?
	1426	H 4.?		1?5?	H 5.?		1?5?	H 5.?		1?5?	L 1.9
	2025	L 1.?		?	?		?0??	L 0.?		19??	H 4.4
6	0227	H 4.?	14	0?3?	L 1.?	22	0?4?	H 5.?	30	0?4?	L 2.?
Su	0842	L 1.?	M	0?1?	H 4.?	Tu	0?3?	L 0.?	F	0?5?	H 5.?
	1451	H 4.9		1?1?	L 1.?		1?4?	H 5.?		1?4?	L 2.4
	2055	L 1.?		1?4?	H 5.?		?0??	L 0.?		?0??	H 4.?
7	0256	H 5.?	15	0?0?	L 1.?	23	0?3?	H 5.?	31	0?0?	L 2.?
M	0907	L 0.?	Tu	1?0?	H 5.?	W	0?3?	L 0.?	Th	1?2?	H 5.?
	1516	H 5.?		1?4?	L 0.?		1?5?	H 5.?		15??	L 2.7
	2123	L 0.?		?0??	H 4.?		?0??	L 0.?		?0??	H 5.7
8	0323	H 5.?	16	0??	L 1.?	24	0?0?	H 5.?			
Tu	0932	L 0.?	W	0?0?	H 5.?	Th	1?2?	L 0.?			
	1541	H 5.?		1?4?	L 0.?		1?0?	H 5.?			
	2151	L 0.?		?0??	H 4.?		1?4?	L 0.?			

DAY	SUNRISE	SUNSET
1	0?2?	1?4?
15	0?2?	1?4?
31	0?1?	1?5?

[illegible] Area, Hawaiian Islands

TIDE TABLE FOR NOVEMBER 1967

[illegible] & Harbor, Inc., Honolulu Headquarters

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0559	H 4.1	9	0127	H 4.2	17	0617	H 4.6	25	0640	H 4.4
F	1230	H 3.5	Th	0805	L 0.6	Fr	1234	H 4.3	M	1250	L 0.5
	1819	H 4.6		1301	H 4.9		1854	H 4.6		1905	H 5.5
	----	----		1946	L 0.6		----	----		----	----
2	0619	H 3.8	10	0155	H 4.7	18	0004	H 4.8	26	0036	L 0.9
Sa	1256	L 2.9	Fr	0845	L 0.7	S	0644	H 4.3	Tu	0658	H 4.2
	1918	H 4.9		1343	H 5.1		1308	H 4.9		1337	L 1.3
	1959	L 2.7		2030	L 0.7		1941	L 1.9		2004	H 5.0
3	0111	H 4.1	11	0234	H 4.5	19	0110	L 0.6	27	0134	L 1.3
Su	0733	L 1.5	M	0926	L 0.9	Su	0744	H 5.0	W	0758	H 5.8
	1351	H 4.4		1425	H 5.2		1411	H 5.2		1435	L 1.7
	1958	L 1.7		[illegible]	[illegible]		2027	L 0.9		2055	H 4.2
4	0151	H 4.4	12	0312	L 0.5	20	0212	H 4.8	28	0240	L 1.6
M	0803	L 1.2	Su	0959	H 4.9	M	0838	L 0.6	Tu	0916	H 5.8
	1442	H 4.8		1506	L 1.0		1449	L 0.7		1536	L 2.1
	2041	L 1.6		2119	H 5.0		2055	L 0.8		2150	H 4.1
5	0225	H 4.6	13	0405	L 0.5	21	0306	H 5.0	29	0344	L 1.8
Tu	0831	L 1.0	M	0947	H 4.9	Tu	0927	L 0.4	W	0959	H 5.4
	1447	H 5.0		1558	L 1.0		1536	H 5.0		1624	L 2.4
	2101	L 1.0		1957	H 4.8		2140	L 0.9		2241	H 3.7
6	0256	H 4.8	14	0454	L 0.6	22	0354	H 5.0	30	0440	L 2.0
W	0859	L 0.8	Tu	0959	H 4.7	W	0958	L 0.4	Th	1049	H 5.4
	1515	H 5.3		1649	L 1.0		1640	H 5.1		1736	L 2.4
	2131	L 0.7		2054	H 4.6		2236	L 0.9		2339	H 3.6
7	0326	H 4.9	15	0537	L 1.0	23	0437	H 4.9			
Th	0926	L 0.6	W	0957	H 4.6	Th	1036	L 0.5			
	1543	H 5.2		1753	L 1.2		1804	H 5.0			
	2201	L 0.6		2200	H 4.5		2356	L 0.8			
8	0356	H 4.9	16	0630	L 1.2	24	0606	H 4.7			
F	0956	L 0.6	Th	1109	H 4.8	Fr	1159	L 0.7			
	1612	H 5.0		1903	L 1.2		1930	H 5.2			
	2233	L 0.6		2340	H 4.8		2454	L 0.6			

DAY	SUNRISE	SUNSET
1	0654	1852
15	0658	1749
30	0702	1650

[illegible] TIDAL DATA, HARBOR ISLAND

[illegible] Tides for [illegible]

[illegible] Lat. [illegible], Long. [illegible] Standard [illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0523	L 2.6	9	0522	H 4.7	17	0021	H 5.3	25	0034	L 0.1
Su	1238	L 0.7	M	1056	L 0.6	We	0647	L 1.1	S	0604	H 4.4
	1838	H 4.4		1630	H 5.9		1301	H 4.6		1154	L 1.0
				2238	L 0.7		1927	L 0.4		1811	H 5.2
2	0611	H 5.6	10	0613	H 4.6	18	0050	H 4.9	26	0040	L 0.8
M	1240	L 0.8	Tu	1113	L 0.7	C	0657	L 1.2	Tu	0655	H 4.7
	1844	H 4.4		1724	H 5.7		1343	H 4.8		1230	L 1.3
	1949	L 2.0					2000	L 0.0		1844	H 4.9
3	0709	H 5.8	11	0714	L 0.6	19	0057	H 4.7	27	0113	L 2.1
Tu	1317	L 0.6	W	0801	H 4.4	Th	0817	L 0.9	F	0716	H 4.6
	1945	H 4.8		1820	L 0.5		1441	H 4.8		1306	L 1.6
	2048	L 1.6		1814	H 5.4		2113	L 0.7		1917	H 4.5
4	0157	H 4.0	12	0058	L 0.6	20	0056	H 4.8	28	0140	L 1.6
W	0956	L 0.7	Th	0916	H 4.2	F	0826	L 0.7	Sa	0756	H 5.0
	1623	H 4.9		1709	L 0.5		1529	H 5.0		1345	L 2.0
	2042	L 2.0		1927	H 5.0		2151	L 0.4		1953	H 4.0
5	0238	H 4.2	13	0014	L 0.1	21	0056	H 4.4	29	0232	L 1.9
Th	0950	L 1.0	F	0942	H 4.0	Sa	0930	L 0.6	Su	0856	H 5.2
	1453	H 5.3		1706	L 0.5		1620	H 5.3		1450	L 2.3
	2114	L 0.5		2002	H 5.6		2230	L 0.4		2026	H 3.6
6	0307	H 4.4	14	0142	L 0.4	22	0159	H 4.6	30	0353	L 1.9
F	0935	L 0.8	Sa	0952	H 3.9	Su	1004	L 0.6	M	1019	H 5.6
	1524	H 5.6		1642	L 0.5		1701	H 5.8		1608	L 2.3
	2150	L 0.4		2056	H 5.8		2340	L 0.4		2215	H 3.4
7	0343	H 4.6	15	0303	L 0.6	23	0337	H 4.6	31	0458	L 2.0
Sa	0936	L 0.6	Su	1046	H 3.9	M	1052	L 0.6		1155	H 5.8
	1557	H 5.8		1652	L 0.6		1743	H 5.7		1733	L 2.3
	2222	L 0.4		2049	H 5.9		2346	L 0.5			
8	0417	H 4.7	16	0355	L 0.6	24	0430	H 4.6			
Su	1010	L 0.5	M	1056	H 4.0	Tu	1122	L 0.7			
	1621	H 5.9		1647	L 0.8		1826	H 5.6			
	2259	L 0.4									

DAY	SUNRISE	SUNSET
1	0609	1737
15	0603	1826
22	0715	1840

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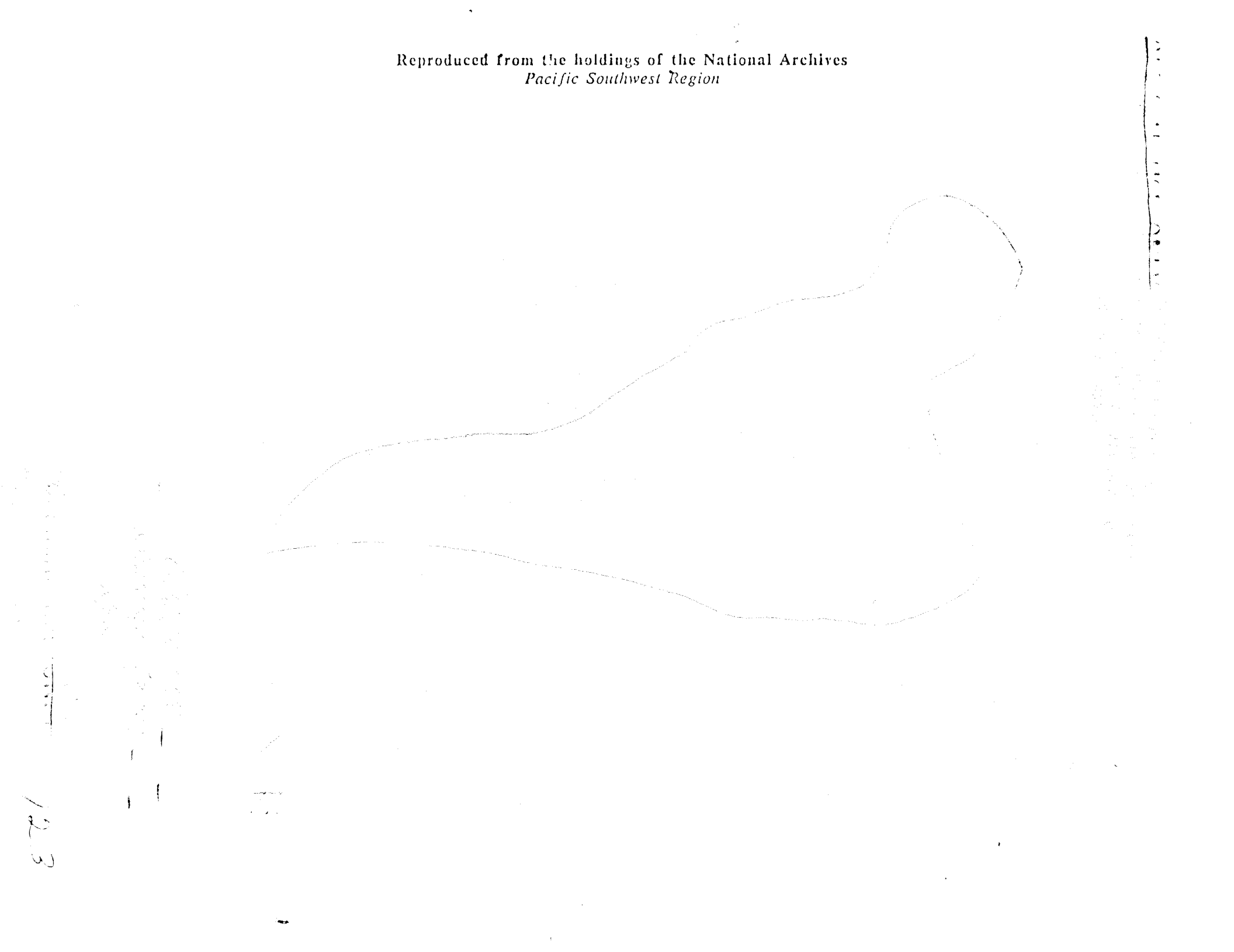
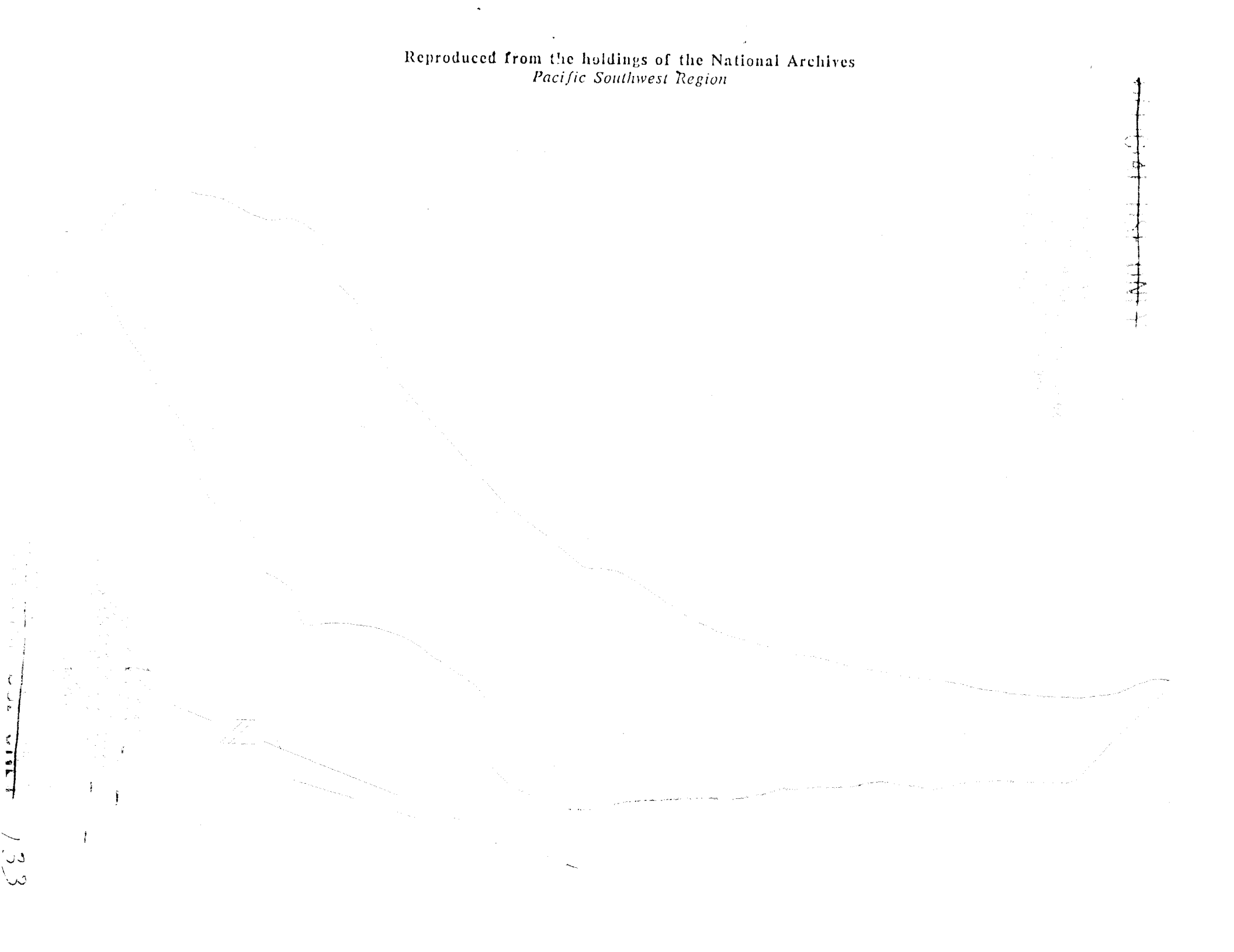
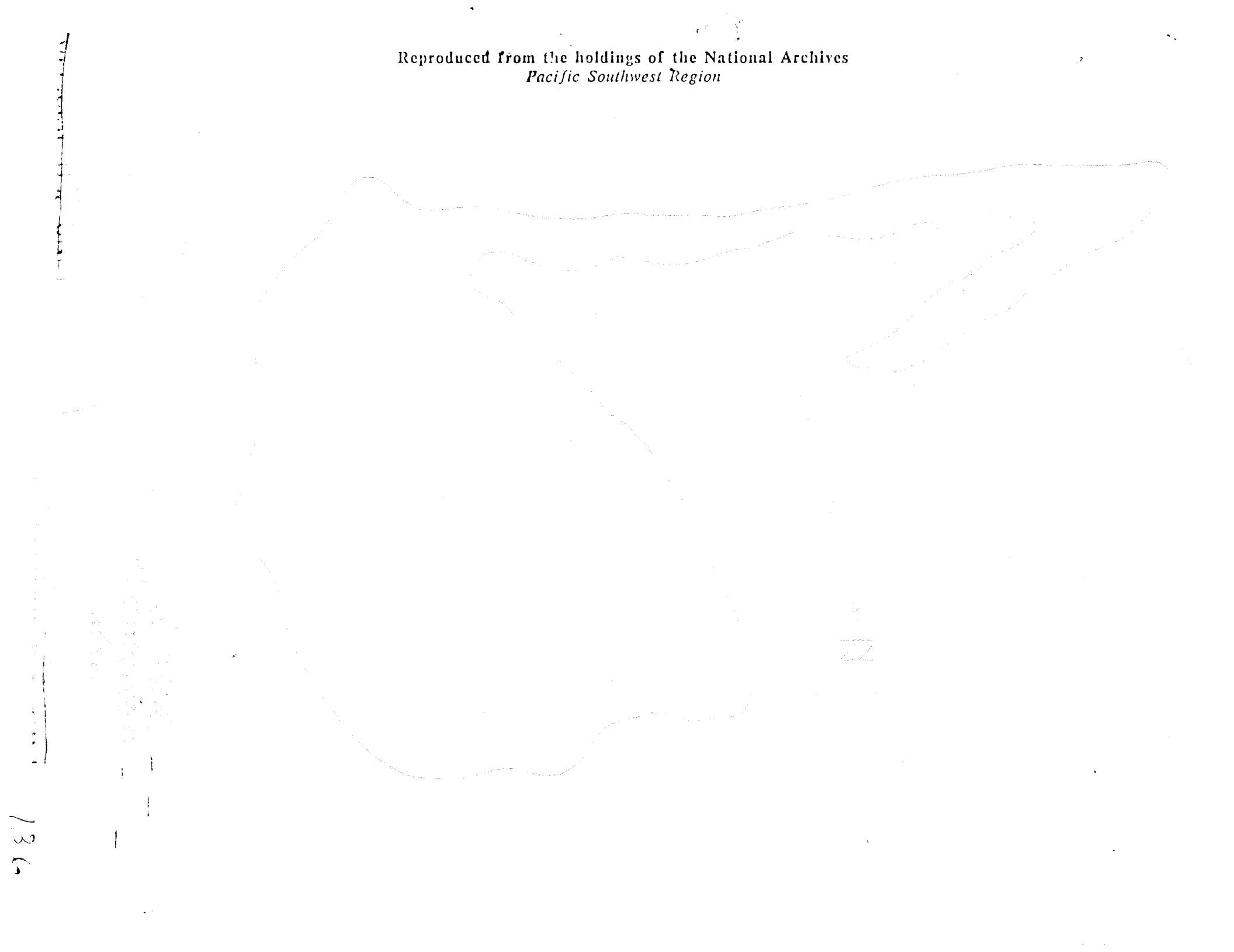
~~OFFICIAL USE ONLY~~



~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~





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Specifications and Procedure

The basis of classification of geodetic control surveys is the accuracy with which the length and direction of a line can be determined. Since it is impossible to ascertain the absolute error, it is essential that the procedure in executing the survey conform to standards which have been established as the result of extensive experimentation and research. For this purpose, the triangulation survey of this department [illegible] Coast and Geodetic Survey.

Specifications are to be followed for each class of the work and much other information of value is contained in Special Publication No. 247, Manual of Geodetic Triangulation published by the USC&GS. This manual will be the textbook for precise surveys, and persons involved in the [illegible] should familiarize themselves with the contents. The following is a summary of the procedure involved in making a survey, and is not intended to replace [illegible] to the manual.

Generally, the [illegible] accuracy and the points whose interrelation are required will be specified by the Client. The approximate locations of the triangulation stations will be determined based on reconnaissance and conformance to strength of figure requirements. Instructions including the above information will be issued to the field for execution of the [illegible].

Reconnaissance. Before observing can be initiated, the stations must be physically established and, if necessary, observing towers erected. Intervisibility of stations must be determined, and the location and height of towers so established that the line of sight has a minimum vertical clearance of ten feet from any object. The minimum safe clearance both vertical and horizontal is dependent on atmospheric conditions, and reference to [illegible] 12", Manual of Reconnaissance for Triangulation, is recommended for information on the subject. Formulas and a table for determining intervisibility will be found in [illegible], page [illegible]. The computed heights of towers to compensate for the earth's curvature [illegible] than the ten feet will give the actual height of towers.

Reference. The following reference [illegible] published by the U.S. Coast and Geodetic Survey should be available at [illegible] where precise triangulation is to be accomplished. The chapters on triangulation [illegible] in many textbooks are based on information from these manuals.

[illegible] 247, Manual of Geodetic Triangulation
[illegible] 245, Manual of Reconnaissance
[illegible] 249, Manual of First Order Triangulation
[illegible] 245, Manual of Second Order Triangulation
[illegible] 248, Manual of Astronomical Triangulation
[illegible] 5, Formulas and Tables for the Computation of Geodetic Positions

[illegible] 247 and 249 are superseded by [illegible], but do contain more detail on some subjects.

INSTRUCTIONS FOR USE OF THE [illegible] THEODOLITE

(Issued by the U.S. Coast and Geodetic Survey)

These instructions are intended for the Wild T-2 Theodolite, but contain information applicable to the Wild T-3.

1. Unpacking and setting up of the instrument. The case is set up with the felt to the rear, and the two lateral screws of the base plate are unscrewed. The hood is then carefully lifted and the two clamping levers are unloosed. The base plate which is fastened to the tripod with a milled screw, is taken out and set on the stand, centered, the three levers are pulled out, the theodolite is set in and the tribrach screws are locked fast with the clamping levers.

2. Leveling. The centering is not altered anymore by leveling, since the point of support of the plumb bob is the plane which passes through the tips of the tribrach screws.

The theodolite should be turned several times about the vertical axis and the telescope transmitted before starting to level.

3. Focussing. The focussing of the eye piece is done by turning the black milled ring until the crosswires become very sharp and black, while the telescope is pointed on a moderately bright background. A person should observe and remember the setting of the ring on the numbered scale, and then use this for future focussing. To focus on the image of the sighting point, turn the nickel focussing ring (testing for freedom of parallax between image and crosswires, by movement of the eyes). For the focussing of the reading microscope, the milled black ocular tube, at the side of the telescope, is turned until the graduations of the circle become sharply defined.

By changing eye-pieces, a person may obtain magnifications of 24, 30 or 40; normally, the magnification of 30 should be used, and this eye-piece should also be used for the zenith prism.

4. Reading the circle. The horizontal and vertical circles are read in the microscope, adjoining the telescope. On the right, next to the slow motion screw for the vertical circle is the milled head screw for the inverting contrivance. By turning the screw clockwise until it stops, the horizontal circle becomes visible in the microscope; then by turning it counterclockwise the image of the vertical circle becomes visible.

The illumination of the circles should be as bright and as equally illuminated as possible. To do this, the illuminating prisms are turned. During the measurement of an angle, the illumination should not be changed. In the reading microscope appear the images of the diametrically opposite portions of the circle, separated by a fine horizontal line, and below (or to the side) the scale images of the second drum.

5. Horizontal Circle Readings. The horizontal circle is graduated to 4 minutes, and is read (left to right) by means of the index, to 2 minutes. The lower row of degree figures is read.

To this circle reading is added double the reading of the seconds drum, since the drum is half [illegible]. The drum is numbered by tenths from 0.0 to 60.0, but this represents an angle of 2' on the face, so that single drum reading is only half the true value and must be multiplied by two before being added to the circle reading. In practice two readings of the drum should be taken and the sum of the two used to the circle reading, thus accomplishing the same result as multiplying the drum reading by 4 and giving the added accuracy of two micrometer readings instead of one. The following example will make this clear:

Circle reading		Seconds drum			Total Reading		
°	'	1st read.	2nd read.	sum	°	'	"
104	58	6.8	6.9	13.7	104	58	13.7
119	10	11.0	11.0	22.0	119	11	22.1
140	20	19.8	20.0	39.8	140	20	39.8
158	30	33.2	32.9	66.1	158	31	06.3
172	52	7.0	7.0	14.0	172	52	14.0
0	12	17.9	17.8	35.7	0	13	35.7
43	28	9.0	9.1	18.1	43	29	18.1

Since only two micrometer readings are required instead of six as in 3-micrometer instruments, greater care and greater refinement of drum readings must be taken with the two readings that are considered sufficient with 3-micrometer theodolites.

The seconds drum reads directly to 0.1 double seconds (0.2 seconds) and all readings should be taken to this degree of refinement. Record the sum of the two readings, also the [illegible] and seconds readings and the direction to the nearest tenth of seconds.

Experience shows that the difference between careful micrometer readings will seldom be greater than 0.3 double seconds (0.6 seconds) and generally no more than 0.1 double seconds (0.2 seconds). If the two readings vary by more than 0.3 double seconds, (0.6 seconds), they should be repeated until two concordant readings are obtained.

6. Vertical circle readings. Before taking readings of the vertical angle, [illegible] the vertical circle bubble as described in the section on the single micrometer instrument and [illegible] the vertical circle bubble before reading the circle. The following is an example of the readings:

Direct	[illegible]	[illegible]
Reverse	[illegible]	[illegible]
Difference (angle of depression)	[illegible]	

With vertical circle [illegible]

Vertical circle readings [illegible] indicate angles of elevation. depression

With vertical circle right

Vertical circle readings [illegible] indicate angles of elevation depression

Records. Forms are provided for each operation in recording the results of observing and computing. These records should be kept on transparencies in order that reproductions can be made of all records of the survey.

All computations which are required to complete these forms should be included in the records of the survey. They should be recorded in an orderly manner, and in sufficient detail that the computations can be checked at the Home Office. References should be made to field books, map compilation data used in computing the survey.

7. Electrical Illumination. There are two sources of illumination:

(a) That for the horizontal circle,
(b) That for the vertical circle and cross-wires.

The record drum is illuminated by the light for whichever circle is being read. The horizontal circle lamp is the one closest to the three wires attached to it: The vertical circle lamp is the one closest to the white. Remove the horizontal and one vertical lamp and insert in prism tube. Then in the clips in the base plate of the instrument case before using the electrical illumination devices.

The cross wires are illuminated by a prism in the upper inside the telescope which intercepts part of the light which goes to the vertical circle. This prism has no adjustment.

A rheostat may be installed in the circuit to regulate the cross-wire illumination. Tests should be made to see if it should be installed between the battery and horizontal circle lamp or between the horizontal and vertical circle lamps. When the current is adjusted to the proper value, a permanent rheostat can be attached if necessary.

To switch off the circuit, pull out one of the small pins at the end of one of the wires of the horizontal circle illuminating attachment.

A very important point is the illumination of the horizontal circle. A diffused light is essential, and this diffusion is not provided by the frosted bulbs, provided with the instrument, to the desirable degree. Bulbs should be painted white, or a piece of paper should be placed over the end of the lamp tube for the illumination of the horizontal circle to give the required diffusion. Permanent changes will be made when the engineers have given the problem their attention. In the meantime, a tube of white paint and a bottle of shellac should be carried by field parties painting bulbs.

Flashlight bulbs for cross-hair illumination of either 2.5 or 3.8 volts may be used. The latter will likely be found more reliable for illumination current from the batteries supplied in a case with some of the instruments. Some bulbs apparently have the wrong screw thread and size of bulb for the prism tube. Before leaving for the field select proper spare bulbs for emergency.

8. Other Points. Watch out for dirt in the horizontal circle. Every few nights close the circle to zero positions by closing on the index at the end of the half set.

Carry the theodolite upright when in the car; do not let this case rest on its side. The theodolite is fastened to the case by the bottom only, and if it rests on its side any vibration will be added to the upper part of the vertical axis, an undesirable condition.

Laboratory tests indicate that the accuracy of determination drops considerably when the telescope is not exactly focused. It is therefore desirable to exactly focus the telescope on a star, after the proper focus is determined for always use the telescope at that focus for precise work. After the exact focus is obtained put a scratch across the edge of the focusing ring and the adjacent part of the telescope tube, so that exact focus may be established or checked at any time.

9. Description of the table.

Effective aperture of the eyepiece objective (free [illegible] 3/8 inches)
Magnification (3 eyepieces) [illegible] 23.4 and 38.5
Length of telescope [illegible] mm. (10 inches)
Sensitivity of plate levers, approx. 2 [illegible] per division
Sensitivity of vertical circle level, approx. [illegible] per 2 mm.
(The coincidence adjustment of the bubble [illegible] doubles the accuracy of centering.)
Magnification of reading microscope [illegible]
Diameter of horizontal circle [illegible] mm. (5½ inches)
Diameter of vertical circle [illegible] mm. (5 3/4 inches)
Division of horizontal circle [illegible]
Division of vertical circle (1/2 double [illegible] minutes, (really 8 minutes)
Value of smallest division of seconds drum, approx. (.1 seconds, really 0.2 seconds
Vertical circle bubble adjusted so that it [illegible] of the horizontal wire.

Weight of instrument [illegible] 11.5 kg. (25.3 lbs.)
" " case [illegible] 5.9 kg. (12.9 lbs.)
" " tripod and accessories [illegible] 7.5 kg. (16.5 lbs.)
Resolving power (24X eyepiece) 2"
" " (30X ") 2"
" " (40X ") 3"

10. Zenith prism. This prism is to be used for astronomic observations. The Zenith prism is a feature of the new [illegible]. The 30 magnification eyepiece is to be used for it.

11. Packing the instrument. The levers of the base plate are released, the instrument is lifted out and set on the base plate of the packing box. In front on one of the supports of the tribrach screws is a nickel mark. A similar mark is on the front edge of the base plate, the instrument must be so set in, that these two marks correspond, then the clamps are closed. The telescope is turned over until the eyepiece almost touches the standards, the standards are turned in the horizontal direction a way that the eyepiece comes over the two marks. The clamping screws for the vertical circle and the horizontal circle are moderately tightened. The base plate with the levers pushed in is again attached to the standards or it may be left on the stand. After carefully closing the hood, the two screws for tightening the hood are turned [illegible].

NOTE: Paragraphs 1 and 11 do not apply to the type of instrument now furnished with the T-3 theodolite owned by this organization.

Specifications of the USC&GS require a set of sixteen positions to be observed for first order triangulation, and six to twelve for second order. Recommendations of the local office of this organization are that for average conditions eight positions be observed for second order triangulation.

The initial settings of the circle for the eight and sixteen position sets are as follows. It is not necessary to set the circle closer than about one-half minute to the setting given.

8 Position

(1)	D	0°	00'	10"
(2)	R	269	00	25
(3)	D	45	00	35
(4)	R	314	00	50
(5)	D	90	00	10
(6)	R	269	00	25
(7)	D	135	00	35
(8)	R	359	00	50

16 Position

(1)	D	0°	00'	10"	(9)	D	90°	00'	10"
(2)	R	179	00	25	(10)	R	269	00	25
(3)	D	22	30	35	(11)	D	112	30	35
(4)	R	202	30	50	(12)	R	292	30	50
(5)	D	45	00	10	(13)	D	135	00	10
(6)	R	224	00	25	(14)	R	314	00	25
(7)	D	67	30	35	(15)	D	157	30	35
(8)	R	247	30	50	(16)	R	337	30	50

After completion of the direct readings on the initial light, direct pointings and readings are made to the clockwise or next additional light of the schedule. Then the telescope is plunged and pointings and readings made on the lights in the reverse order to and including the initial light. This completes position number one. With the telescope remaining reversed, the circle is set for position two, and pointings on the initial and other lights are made in the same manner as for position one. This procedure is repeated until the required number of positions have been observed. The reflected pointings are not observed.

It frequently happens that one or more lights are not visible during all or part of the time that the main sights are being taken upon the other stations. Little time should be spent waiting for a light to rise. The position missed can be observed later, using the same initial light as for the first series, or some other main scheme station observed most during the series.

Every effort should be made to complete satisfactory sets to all required stations while occupying a station, as a second occupation will generally need another night's work if the preceding station is included.

Rejection of Observations

The greater part of the time involved in the observing program is in preparation to observe, transporting, setting up, adjusting lights, etc. Once ready to go, any refinement in observing which may help to decrease the probability of re-observing a station is well justified. A rigorous application of the rejection limits to observations, even though the occasional rejected one just outside the limit, will result in a saving of time and effort.

The following is a summary of rejection rules as applied by the USC & GS, and may be found in more detail in C&GS Spec. Pub. 247, pages 170 and 171.

(1) Any measurement of a direction deviating by more than four seconds from the mean for first-order triangulation, and by more than five seconds for second order, shall be rejected if it was observed using the same position setting.

(2) In applying the rejection limit the value of a direction should be rounded off to the nearest tenth of a second, and the criterion applied to each observation to the tenth of a second.

(3) If any observations are so far from the approximate mean as to obviously exceed the limit, these should be rejected before taking the trial mean and thus possibly re-observed.

(4) No reading should be rejected if it falls within the limit of retention unless rejected at the time of observation.

(5) A trial mean is taken, and using the rejection limit any observation (including the individual ones forming a position mean) which differs by more than the limit from the trial mean is rejected. The rejected positions are re-observed.

(6) After a trial mean is obtained using the rejection limit applied, none of the observations rejected should be again included even though the new mean would bring them within the limit of rejection.

(7) Using a new mean, the rejection limit is again applied. If any of these observations fall outside the rejection limit they are rejected, and new observations and new means taken until all accepted positions are within the limits of the rejection.

(8) If one reading of two or more observations falls without and one within the limits of rejection, do not use the mean even though it comes within the limit. Use judgment with the reading within the limit and reject the other.

(9) If two readings fall without the limits, one being abnormally high and the other abnormally low, and the mean falls within the limit, both readings should be rejected.

(10) If two or more readings have been taken for a single position, the mean should be used if the readings are within the limit of retention.

(11) Occasionally conditions will be encountered which make it difficult to bring all readings within rejection limits. There will be an abnormal spread in direct and reverse readings, but the position mean will be well within the limits. If the number of rejections is averaging much in excess of ten percent of the entire number of observations, the rejection limit may be increased. Before this is done, every effort should be made to determine the cause of the large range.

Record of Topographic Directions

The following Record of Topographic Directions contains the field record of observing an eight-position set to record by [illegible] directions. It is followed by an "Abstract of Directions" which contains the position directions and the mean of the eight positions in each direction.

The process of establishing the mean direction of a position may be understood by a study of the records for position No. 1 only.

(a) The direct and reverse readings are recorded for each observed station.

(b) The initial and ending readings on the initial station are meaned.

(c) The mean reading on the initial station established by a and b is subtracted from the mean D and R for each successive observed station to establish the direction for that position.

A trial mean is established by dividing the sum of the directions for each of the eight positions by the number of positions. In this case (see Abstract of Directions) 40.0" for station Baker and 00.0" for station Log.

With these trial means each position is checked for compliance with rejection limits. Two examples of rejection follow:

Position No. 4. The trial mean for direction Baker is 40.0". It is obvious that 46.5 is outside the five second rejection limit.

The mean D/R for a direction of 40.0 is obtained by subtracting the difference between the direction and zero D/R for Baker at this position, or: 47.5 - (46.5 - 39.0) = 39.5.

It is then found that the direct reading 39.5 is within limits and that the reverse reading 39.5 is outside the limits and is rejected. 21.5 is accepted for the mean D/R.

Position No. 2. The reading 00.0, or 60.0, is obviously outside the five-second rejection limit of 40.0 + (46.0 - 45.0) + 50.0. The direct and reverse readings of 54.0" and 56.0" are both outside the limits so the position is rejected and is recorded (see below of the same page).

In the Abstract of Directions a line is drawn through the original direction for Position 4 of 46.5" and the new direction of 39.5" is entered. The new direction for Position 7 of 39.0" is entered in the same manner.

A new mean direction is established and a check is made of the positions to determine that the directions for the positions and all position mean D's & R's are within the limits of their means.

It will be found that the process can be applied with equal ease to the successive portions of channels, and that the readings which are obtainable outside limits. This possible re-observing there confirms the determination of total mean, and will enable the number of observations to be reduced. For instance, for the directions of 60°, 90° and 120° it was assumed that the third observation on Baker, when a direction of 75° 1' was determined for horizon A, would be sufficient as indicated.

Triangle Closure. A good example for triangle closures are that the maximum error in closure of any triangle shall not exceed three seconds for first order, five for second, and ten for third order, but that the average triangle closure where triangulation is being executed in a network or figures shall not exceed one second for first order, three for second, and five for third order. (See C. S. 247, page xvii.)

Abstract of Directions. An Abstract of Directions will be kept as a part of the observing procedure for each station, and will list the direction for each position, the sum and the mean directions. (C.S. 247, pages 26, 149 to 150.)

List of Directions. The List of Directions will generally list only the mean directions from the occupied station to each of the other stations. Where an eccentric instrument or signal is involved the reduction and corrected direction to the true station will be shown. (C.S. 247, page 152 to 157.)

Triangle Computations. The form for triangle computations is set up to record the computation of two full triangles of a quadrilateral on one sheet. The newly used station is always numbered last, the other stations 1 and 2 in a clockwise order, with the line 1-2 being the known line. The procedure in computing the triangles is explained in C.S. 247, pages 155 to 156.

Spherical Excess. The spherical excess in a figure is not considered in computing a plane triangle, but the spherical angle will be required in computing the geographic position. The spherical angle is larger than its plane angle, and the correction should be computed as explained in C.S. 247, pages 149, 157 and 171.

Side Checks. In the computation of a quadrilateral there are always three lines which have two values in lieu of their length. One of the requirements of triangulation is that the difference between the two values for the logarithm of the length of a line be no greater than two units in the last place. A difference for one second of the smallest distance table involved in the computation of either value for first order triangulation, can be used for second order.

These side checks are the first indication of the quality of the observed angles, as it is possible for the triangles of a quadrilateral to close within the prescribed limits and not meet the requirements of the side check. The side check condition should be satisfied before the closing of a quadrilateral is considered complete, as re-observing may be necessary.

Side equation tests should be made when the stations are tapped by order to isolate the directions that be faulty. (See C.S. 247, pages 10, 159 to 171, and xvii.)

Geographic Positions. The geographic positions of the stations should be computed by the Jamalin or Sinnott program on an IBM card or the computer of the

previous computations. A description of the [illegible] is given in S.P. 8, Formulas and Tables for Computation of Geodetic Positions. The latitude functions listed therein are necessary in computing the positions. (See also S.P. 247, pages 175 to 179.)

Triangulation Adjustment. The procedure outlined to this point is normally considered as included in the observing and field (or jobsite) computing. Due to the limited extent of the schemes surveyed by this organization, it is generally considered that when the side conditions have been satisfied further adjustment is not practical. On surveys where a coordinate system will be established and it is desirable that the values of a station remain exactly the same, independent of the direction of computation through the net, an additional adjustment is applied.

This refinement results in slight changes in the values, and a full least square adjustment is not considered practical for a limited scheme. A modified adjustment which meets the requirements of small schemes is included in this set of instructions.

HOLMES & NARVER INC. ENGINEERS JOB NO ____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER F.P.C INST. NO. 17803 STATION RED

RECORDER G.H.B DATE 11-5-51 SET NO. 1

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
1	ABLE	1110 PM	D	00-00-20.0	19.5 +0.5 = 20.0		
			R	180-00-18.9			
	BAKER		D	74-30-56.5	56.5	36.5	
			R	254-30-56.4			
	FOX		D	163-39-30.6	31.5	11.5	
			R	343-39-32.4			
	ABLE		D	00-00-21.0	21.5 −0.5 = 20.0		
			R	180-00-20.0			
2	ABLE		D	45-00-50.0	50.7		
			R	225-00-51.5			
	BAKER		D	119-31-32.0	29.0	38.3	
			R	299-31-26.0			
	FOX		D	208-40-00.7	59.7	09.0	
			R	28-39-58.7			
	ABLE		D	45-00-51.2	50.6 +0.1 = 50.7		
			R	225-00-50.0			
3	ABLE		D	90-01-10.0	11.7		
			R	270-01-13.5			
	BAKER		D	164-31-51.9	51.9	40.2	
			R	344-31-51.9			
	FOX		D	253-40-17.9	17.4	05.7	
			R	73-40-16.9			
	ABLE		D	90-01-13.7	11.8 −0.1 = 11.7		
			R	270-01-10.3			
4.	ABLE		D	135-01-40.0	38.7 +0.6 = 39.3		
			R	315-01-37.3			
	BAKER		D	209-32-21.6	21.6		
			R	~~29-32-24.5~~	~~24.6~~		REJECT (R)
	FOX		D	298-4[illegible]	48.0	08.7	
			R	118-4[illegible]			
	ABLE		D	135-01-39.7	39.9 +0.6 = 40.3		
			R	315-01-[illegible]			
			D				
			R				

FOLME & NARVER ENGINEERS JOB NO

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER FPC. INST. NO. 17803 STATION REO

RECORDER GHB DATE 11-5-51 SET NO. 1

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
5	ABLE		D	22-00-20.0	174		
			R	202-00-14.8	+2.3 / 19.7		
	BAKER		D	96-30-58.4	57.2	37.5	
			R	276-30-55.8			
	FOX		D	185-39-31.8	30.3	10.6	
			R	05-39-28.9			
	ABLE		D	22-00-23.8	21.9		
			R	202-00-20.0	-2.2 / 19.7		
6	ABLE		D	67-00-50.0	49.7		
			R	247-00-49.4	+1.0 / 50.7		
	BAKER		D	141-31-30.6	29.7	39.0	
			R	321-31-28.8			
	FOX		D	230-40-00.6	58.7	08.0	
			R	50-39-56.7			
	ABLE		D	67-00-53.7	51.8		
			R	247-00-50.0	-1.1 / 50.7		
7	ABLE		D	112-01-10.0	10.8		
			R	292-01-11.6	+0.1 / 10.9		
	BAKER		D	186-31-56.0	56.1	45.2	REJECT (SEE BELOW)
			R	06-31-56.2			
	FOX		D	275-40-21.7	21.4	10.5	
			R	95-40-21.2			
	ABLE		D	112-01-12.1	11.0		
			R	292-01-10.0	-0.1 / 10.9		
8	ABLE		D	157-01-14	38.8		
			R	337-01-[illegible]	+0.1 / 38.9		
	BAKER		D	[illegible]	16.0	38.3	
			R	5-[illegible]			
	FOX		D	320-40-44.2	46.9	07.2	
			R	140-40-49.6			
	ABLE		D	157-01-[illegible]	40.6		
			R	[illegible]	0.9 / 39.7		
			D				
			R				

HOLMES & NARVER, INC. ENGINEERS JOB NO ____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER E.P.L. INST. NO. 1803 STATION Red

RECORDER G.H.B. DATE 11-5-51 SET NO 2

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
7	ABLE	1140 PM	D	112-01-10.6	10.7 +0.2		
			R	292-01-11.4	10.9		
	BAKER		D	186-31-46.0			
			R	06-31-51.4	48.7	37.8	
	ABLE	1145 PM	D	112-01-12.3	11.1 +0.2		
			R	292-01-10.0	10.9		
			D				
			R				
			D				
			R				
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JOB NO ____

HOLMES & NARVER, INC., ENGINEERS

ABSTRACT OF DIRECTIONS

STATION R2-L COMPUTED BY S.A.B. DATE 11-5-51
OBSERVER E.P.S. CHECKED BY [illegible] INST. 17803

POSITION	STATIONS OBSERVED		
	ABLE	BAKER	[illegible]
	INITIAL		
	[illegible]	14°30'	163°30'
1	[illegible]	36.1	1.5
2	[illegible]	38.1	2.6
3	[illegible]	40.4	3.4
4	[illegible]	42.1	4.9
5	[illegible]	43.4	6.4
6	[illegible]	45.0	7.8
7	[illegible]	46.6	9.5
8	[illegible]	48.3	11.2
9	[illegible]		
10	[illegible]		
11	[illegible]		
12	[illegible]		
13	[illegible]		
14	[illegible]		
15	[illegible]		
16	[illegible]		
		[illegible]	
	SUM	48.3	11.2
		[illegible]	
	MEAN	24.1	5.6
CORRECTED			
		[illegible]	[illegible]
DIRECTION		24.1	5.6

COORDINATE REDUCTION OF THE THREE POINT PROBLEM

The following reduction of the three point problem is due to Mr. W. O. Pyrd, formerly Chief of the Computing Section, Division of Surveys, of the Tennessee Valley Authority, Chattanooga, Tennessee.

In the figure are shown the three points whose coordinates, indicated by the subscripts, and the point whose plane coordinates X, Y, are to be determined. The first step is to shift the origin of coordinates to the point X_3, Y_3, obtaining:

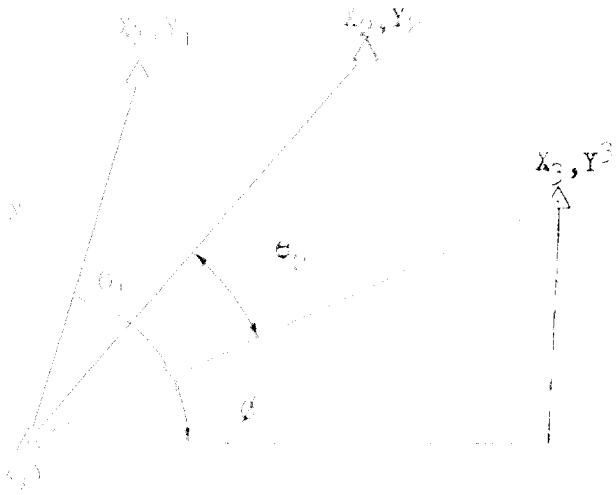
$$X_3' = Y_3' = 0$$

$$X_1' = X_1 - X_3$$

$$Y_1' = Y_1 - Y_3$$

$$X_2' = X_2 - X_3$$

$$Y_2' = Y_2 - Y_3$$



From the figure, $\tan \alpha_1 = \frac{Y_1'}{X_1'}$, and by trigonometry

$$\tan (\alpha_1 + \theta_1) = \frac{\tan \alpha_1 + \tan \theta_1}{1 - \tan \alpha_1 \tan \theta_1}$$

$$\tan (\alpha_2 + \theta_2) = \frac{\tan \alpha_2 + \tan \theta_2}{1 - \tan \alpha_2 \tan \theta_2}$$

$$\frac{Y_1' - Y'}{X_1' - X'} = \frac{\frac{Y_1'}{X_1'} + m_1}{1 - \frac{Y_1'}{X_1'} m_1} = \frac{Y_1' + m_1 X_1'}{X_1' - m_1 Y_1'}$$

$$\frac{Y_2' - Y'}{X_2' - X'} = \frac{\frac{Y_2'}{X_2'} + m_2}{1 - \frac{Y_2'}{X_2'} m_2} = \frac{Y_2' + m_2 X_2'}{X_2' - m_2 Y_2'}$$

where $\tan \theta_1 = m_1$ and $\tan \theta_2 = m_2$.

Clearing of fractions:

$$(Y_1' - Y')(X_1' - m_1 Y_1') = (X_1' - X')(Y_1' + m_1 X_1')$$

$$(Y_2' - Y')(X_2' - m_2 Y_2') = (X_2' - X')(Y_2' + m_2 X_2')$$

Performing the indicated multiplications:

$$Y_1' X_1' - m_1 Y_1'^2 - Y' X_1' + m_1 Y' Y_1' = X_1' Y_1' + m_1 X_1'^2 - X' Y_1' - m_1 X' X_1'$$

Collecting terms and dividing the first equation by m_1, the second by m_2

$(Y'^2 + X'^2) - X'(Y_1 \ldots A_1) + Y'(Y_1 + \ldots) = 0$ .... (1)

$(Y'^2 + X'^2) + X'(Y_2 \ldots A_2) - Y'(Y_2 + A_2) = 0$

Setting the second factor of the second and third terms in the above equations equal to A, B, C and D, we have

$A = Y'_1 \cot \theta_1 - X'_1$; $B = Y'_1 \cot \theta_1$ [illegible]; $C = Y'_2 \cot \theta_2 - X'_2$; $D = Y'_2 + X'_2 \cot \theta_2$

Subtracting the second of the equations (1) from the first,

$X'(A - C) - Y'(B - D) = 0$

$Y' = X' \frac{C - A}{D - B} = X'R$ where $R = \frac{C - A}{D - B}$

Substituting this value of Y' into the first of the equations (1) we have

$X'^2(R^2 + 1) + X'A - X'RB = 0$ whence

$X' = \frac{RB - A}{1 + R^2}$

And finally [illegible]

The quantity R furnishes a measure of the [illegible] of the solution, the problem becoming indeterminate as R approaches [illegible] 0/0. For example, if X'_1, Y'_1, X'_2, Y'_2 are of the order of several thousand feet, and C - A and D - B are of the order of 50 or 100 feet, the point X is close to the circle passing through the known points, and the solution is weak.

The only formal [illegible] involved in this solution is taking two cotangents from a table of natural functions. For [illegible] of the angles, these functions might become very large, [illegible]. This difficulty can be avoided by so selecting the initial line as to keep these functions down to a reasonable figure generally less than [illegible].

R might in some cases [illegible] very close to [illegible] or become practically infinite, should the point X, [illegible]. However these difficulties seldom arise in practice. In several hundred three point solutions the writer has had to reject perhaps half a dozen [illegible], and has never had to shift the initial line to get a finite value for R.

When a large number of three point determinations are to be made, it is well to solve them on a mimeographed form [illegible] the following problem is solved has been found highly satisfactory. The first step is to enter the coordinates of the known points in the appropriate places in the [illegible] part of the form. After the unknown coordinates have been found the coordinates [illegible] are entered, and the solutions checked by inversing between [illegible] and each of the known points. The difference in the azimuths of these [illegible] should check the observed angles. Space is provided for the fourth point which should be observed whenever possible, both as a check on the fix as well as the method, and for [illegible] in the event that the solution based on the selected three points should prove to be weak.

The solution differs from the derivation [illegible] first for Y instead of X. The solution can be [illegible] by omitting those lines not marked (#) by carrying the work in the computing machine.

θ

X_1

$-X_3$

$\# X_1'$

mX

Y

$\# B$

To Shift Coords.
$X_3 = Y_3 = 0$
$X' = X - X_3$
$Y = Y - Y_3$
$X = X - X_3$
$Y = Y - Y_3$

$\# R = \frac{S}{}$

Y_1
Y_3
Y'
mY
X'
A
B
C
D

$\tan \theta$

X_2
X_3
X_2'
mX_2
Y_2'
D
C
A
B

$R^2 =$

$\tan \theta_2$

Y_2
Y_3
Y_2'
mY_2
X_2
C

$A = X_1 \cot \theta_1 - Y_1$
$B = Y_1 + X_1 \cot \theta$
$C = Y_2 \cot \theta_2 - X_2$
$D = Y_2 + X_2' \cot \theta_2$

$R = \frac{C-A}{D-B}$

$X' = \frac{RB-A}{1+R^2}$

$Y' = Y' D$

$Y_2 = RX_2$
Y_3
Y_P

$X_2' = X_2 \cos \theta_2$
X_3
X_P

STATION	DISTANCE	AZIMUTH	SIN (AZIMUTH)	X	Y

Computed
Checked

Since the measured angles are spherical angles, each triangle will contain more than 180°, the amount by which [illegible] is termed the spherical excess and about one second for each [illegible] of area of triangle. More exactly, the total spherical excess [illegible] is obtained by the formula (see Special Publication No. 6, p. 7)

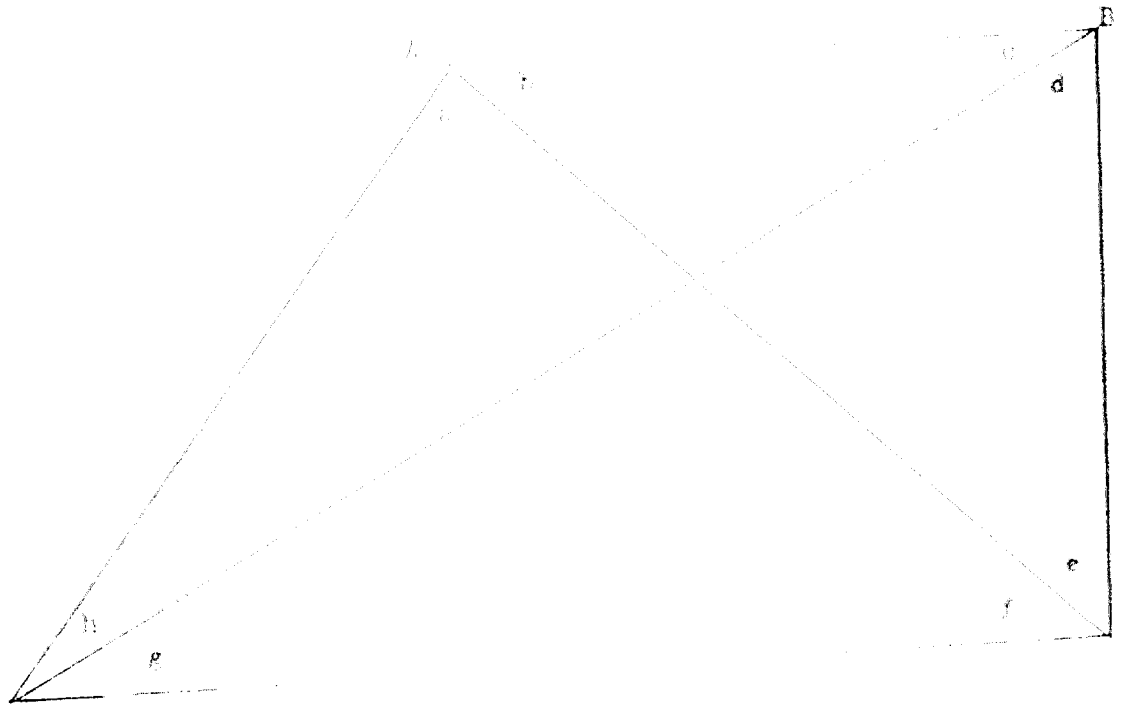
$$\epsilon = A_1 b_1 \sin(\ldots)$$

where ϵ is the spherical excess, [illegible] are the two sides and the included angle, respectively, of the corresponding [illegible]. The latter letter m is used to designate that part of the expression which depends only on the latitude and the dimensions of the spheroid and the values of log m are given with the latitude as an argument in the table on page [illegible] of Special Publication No. 6.

It is clear that no correction for spherical excess will be necessary unless the triangles are very large, and then only for the most precise work. One third of the correction is subtracted from each of the angles.

ADJUSTMENT OF A QUADRILATERAL

Before starting the adjustment of a figure or triangulation the computer should make a good clear sketch showing all the lines on which observations were made. The angles around each station of a quadrilateral are adjusted to total 360° before the figure adjustment is made. In the figure adjustment, two conditions are considered: (1) the geometric condition that the sum of the interior angles of a rectilinear figure is equal to $(n-2)180°$, in which n is the number of sides of the figure; and (2) the trigonometric condition that in any triangle the sines of the angles are proportional to the lengths of the [illegible] opposite.



1. Geometric conditions. When all the sides of a quadrilateral are measured, there are four overlapping triangles. These are shown as triangles ABC, ACD, ABD, and BCD in the figure. In each of these triangles the sum of the three angles must be 180°. Hence from the figure

$$b + c + d + e = 180^\circ \quad (1)$$
$$a + f + g + h = 180^\circ \quad (2)$$
$$a + b + c + h = 180^\circ \quad (3)$$
$$d + e + f + g = 180^\circ \quad (4)$$

Also the sum of the eight lettered angles in the figure must equal 360°, since they form the interior angles of a plane figure of four sides. This may be derived also by the addition of Eqs. (1) and (2) or (3) and (4)

$$a + b + c + d + e + f + g + h = 360^\circ \quad (5)$$

Further, since the opposite angles at the intersection of the diagonals must be equal, it follows that

$$b + c = f + g \quad (6)$$

$$d + e = a + h \quad (7)$$

Equation (6) is the equivalent of Eq. (1) minus Eq. (3) and Eq. (7) is the equivalent of Eq. (2) minus Eq. (4).

If any three of these seven equations are satisfied, the other four must of necessity be satisfied also. Equations (5), (6), and (7) are the ones most convenient to use.

The following procedure is suggested for triangulation of ordinary precision.

A. Make the station adjustment as follows: Adjust the angles around each point to make their sum equal 360° by dividing the error equally (or approximately so) among the set of angles. (Use consistently with non-repeating instrument).

B. Using the values resulting from the station adjustment A, and the eight angles a, b, c, d, e, f, g, h, as read, find their sum from 360°. Divide the difference by 8, and add algebraically and the result to each of the eight angles, thus satisfying the conditions of Eq. (5).

C. Using the adjusted values from B, find the difference between the sums (b + c) and (f + g) and divide this difference by four. Apply the result as a correction to each of the four angles, increasing each of the two whose sum is the smaller and decreasing each of the two whose sum is the larger, thus making these angles satisfy Eq. (6) without disturbing the adjustment for Eq. (5). Proceed in the same way with each of the four angles involved in Eq. (7).

2. Trigonometric Conditions. If the length of one line, as BC, is known, and the length of the side AB is to be computed, the computer may select one or another series of computation for use in accomplishing this result. For example, a solution of triangle ABC gives the length of AB, then from triangle ACE the required length of AE is found, and in the triangle ABE the length AF is found, then in AFE the length EF is computed. There are four possible chains

of route through the figure. Since results are to be given to the angle, as so far adjusted, are sufficient to make the value of the length of a computed side independent of the route used. Assume that the length of BC is known and the length of AD is to be found.

$$\text{(8)}$$

$$\text{(9)}$$

Similarly,

$$\text{(10)}$$

Equating these two values of AD,

$$\text{(11)}$$

or

$$\text{(12)}$$

Expressed in logarithmic form, this is

$$\log \sin a + \log \sin c + \log \sin e + \log \sin g$$
$$= \log \sin b + \log \sin d + \log \sin f + \log \sin h \quad \text{(13)}$$

The angles can be tested for consistency by adding their logarithmic sines in the two groups as specified and by finding the difference between the two sums.

Various adjustments by which this difference may be reduced to zero are possible. The least squares adjustment gives the most probable values for the adjusted angles, but it is somewhat more complicated than is necessary for most surveys. A simple approximate method which gives a good correction to each angle and does not disturb the geometric conditions to be followed (see adjustment of the following example) is:

(a) Record the log sines to check for the 8 angles.

(b) For each angle, record the tabular log sine and difference for 1" and write each together.

(c) Find the average logarithmic change (d) in log sine by dividing the difference between the sums by 8.

(d) Find the correction (c) for each angle.

(e) The method of applying the number of seconds of correction to each angle

(c) Add this correction to each of the observed directions (sum of values in column 2 of the angle, and subtract it from each of the angles the sum of those for sides in the figure, and that the corrected values are obtained.

If one or more of the angles is greater than 90°, adjustment D is made as just described, with the exception that the correction is subtracted. However, since the sine of an obtuse angle decreases as the angle increases, the corresponding log sines will be changed in the direction opposite to that desired. Usually the error introduced by this condition will be negligible for this approximate adjustment; if not, adjustment B should be used.

Example: Given the angles as measured in the quadrilateral (see figure), for which the station adjustment (each angle 1) has been made (see second column of following table), find the adjusted angles for both the geometric and the trigonometric conditions.

Angle	Station adjustment	Figure adjustment		
		Geometric condition		Trigonometric condition
	Adjustment A	Adjustment B	Adjustment C	Adjustment D
a	94-05-50.5	50.7	51.5	52.8
b	48-03-35.4	35.6	36.4	37.3
c	20-47-18.0	18.2	19.0	19.2
d	67-40-51.2	51.4	52.2	52.7
e	50-29-49.0	49.2	50.0	50.7
f	43-44-01.4	01.6	02.4	01.8
g	79-26-12.9	13.1	13.9	13.7
h	17-03-44.2	44.4	45.2	43.7
Sum	360-00-57.5	360-00-00.0	360-00-00.0	360-00-00.0

Adjustment D: The sum of the angles is 1.5" too large, resulting from the station adjustment A. It must be diminished by the amount of 1.5". This amount divided by the number of angles gives the amount to be subtracted (0.2") from each angle as shown in the last column in the table.

Adjustment 2 [illegible]

Dividing this difference by h_2 the correction to each angle is found to be [illegible], to be subtracted from the angles b and e, and added to the angles f and h. In like manner, the correction for each of the angles a, c, d, and g is found to be 0.2", and is added to angles a and c, and subtracted from d and g. Since these computations are carried out only to the tenths of seconds, 0.5" is added to d, 0.5" added to g, 0.2" added to a and c, and 0.2" subtracted from h_2. The resulting values are shown in the fourth column of the table.

Adjustment 3. Trigonometric Conditions. The logarithmic sines of the angles as given by adjustment 2 and as indicated in equation (32) are recorded as shown in the following tabulation, and the tabular difference for 1" is recorded for each angle.

		Difference for 1"
log sin a	9.9298876	3.0
log sin c	9.5599035	16.5
log sin d	9.8872853	12.4
log sin g	9.6424960	10.5
	9.0295724	
log sin b	9.9210202	12.9
log sin e	9.5860474	21.3
log sin f	9.8550419	26.2
log sin h	9.6414474	19.7
	9.0035569	
	9.0295724	
	0.0260155	107.4
	3.778	29.7 = $\frac{1}{s}$
	7.8 = c	

The difference between the two sums is 0.2 units of the seven places of logarithms used. This value, divided by h_2 gives the average required change in log sins, 7.8 = c. The average tabular difference for 1" is 29.7 = $\frac{1}{s}$.

Hence $\frac{c}{s} = \frac{7.8}{29.7}$ = .3" (nearly), which is the average correction to be applied to each angle. Incidentally, .3 will be added to angles a, c, d, and g, and subtracted from angles b, e, f, and h.

Since this adjustment is applied with opposite signs to alternate angles it does not disturb the geometric condition. The final adjustment is given in the fifth column of the foregoing table.

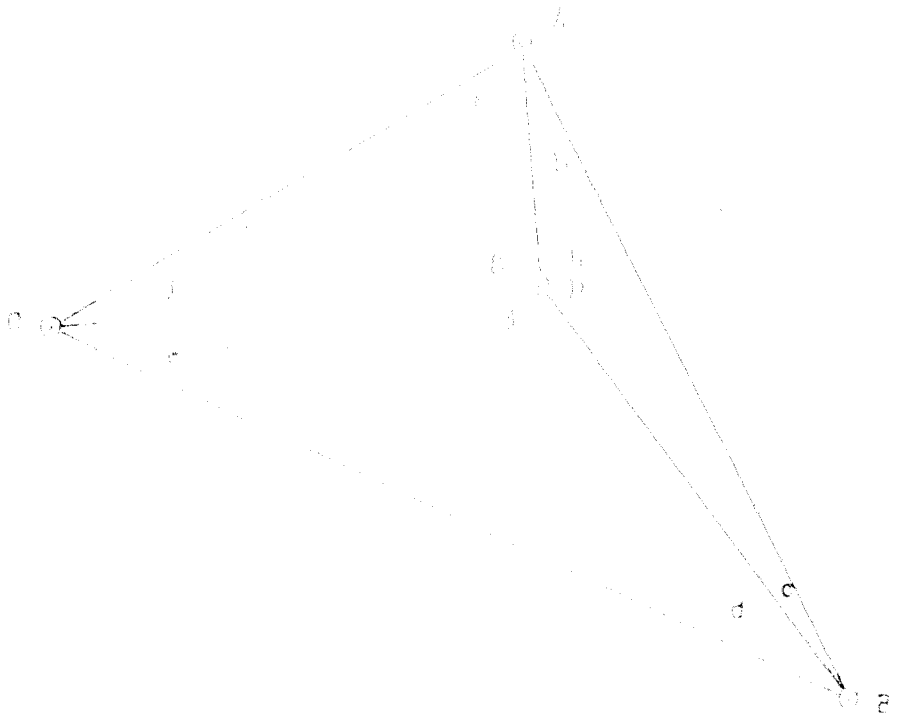
If the triangulation system consists of a chain of quadrilaterals, each quadrilateral is adjusted in the manner just described. The computations for length of the various lines are then carried through the chain from the base line

COMPUTATION OF TRIANGLES

COMPUTED [illegible] AND [illegible] DATE 12-29-51

STATION		ANGLES OBS.	SPHERICAL ANGLE	SPHERICAL EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3					7494.68	3.8747533
1	A	[illegible]			03.3	0.1285794
2	B	[illegible]			06.0	9.9951673
3	C	[illegible]			50.7	9.8872857
1-3					9965.52	3.9985000
1-2					7773.53	3.8906184
2-3						3.9985000
1	D	44 - 29 - 58.6			59.4	0.1543395
2	A	91 - 05 - 58.[illegible]			58.8	0.9988873
3	C	[illegible]			01.8	9.8204106
1-3					1418164	4.1517268
1-2					9402.64	3.9732501
2-3					7494.68	3.8747533
1	D	[illegible]			15.7	0.3365028
2	B	[illegible]			51.8	9.9404703
3	C	[illegible]			52.5	0.9997658
1-3					4181.64	4.1517264
1-2					16256.31	4.2110219
2-3						4.2110219
1	A	[illegible]			02.1	0.2121229
2	B	[illegible]			14.2	9.5501052
3	C	[illegible]			43.7	9.4674730
1-3					9402.64	3.9732500
1-2					7773.53	3.8906178

As in the case of the quadrilateral, the angles around each station of a central point figure are adjusted to total 360° before the figure adjustment is made. In the figure adjustments of the quadrilateral, two conditions are considered: (1) the geometric condition, and (2) the trigonometric condition.



1. Geometric Condition. At each station of a central point figure the sum of the three angles must be 180°. Hence, for the figure,

a + b + c = 180° (1)
e + c + b = 180° (2)
d + e + f = 180° (3)

Also the sum of the (in this case) eight angles forming the closed figure must total (n-2)180° where n is the number of sides of the figure (in this case 1800°)

a + b + c + d + e + f = 1080° (4)

Also the sum of the angles around the central point must total 360°.

c + b + e = 360° (5)

The following procedure is suggested for the computation of ordinary precision:

A. Make the station adjustment as follows: Adjust the angles around each point to make their sum equal 360° by distributing the error equally (or approximately so) to the several angles.

B. Using the values resulting from the station adjustment A, add the three angles of each triangle and subtract the sum from 180°, distribute the difference among the three angles (one to each angle) so that the sum will be 180°, keeping in mind that the sum of the angles around the central point must remain 360°. This will necessitate computing the angle at the central point by an unequal amount from those forming the outer figure. This satisfies Eqs. (1), (2), (3) and (5). Eq. (4) is satisfied below.

2. Trigonometric condition. There are two possible chains of route through the figure. It is necessary to see whether the angles, as so far adjusted, are so related as to make the value of a length of a computed side independent of the route used. A derivation, similar to that in the quadrilateral adjustment, gives the following equation:

$$\frac{\sin \quad \sin \quad \sin}{\sin \quad \sin \quad \sin} = 1 \qquad (6)$$

The angles are tested for satisfaction of this equation by either the logarithmic sines, as in the procedure for adjustment of a quadrilateral. The approximate method of successive trials (equally varying the angles) suggested for the quadrilateral may be used for the central point figure.

Example: Given the angles as measured in the central point figure (see fig.) for which the station adjustment (adjustment A) has been made (see second column of following table), find the adjusted angles for both the geometric and the trigonometric conditions.

Angle	Station Adjustment	Figure Adjustment	
		Geometric Condition	Trigonometric Condition
	Adjustment A	Adjustment B	Adjustment C
a	61° - 06' - 52.07	61° - 06' - 52.07	61° - 06' - 52.07
b	21° - 00' - 45.29	21° - 00' - 45.29	21° - 00' - 45.29
c	97° - 53' - 21.56	97° - 53' - 21.64	97° - 53' - 14.83
d	29° - 59' - 56.36	29° - 59' - 56.44	29° - 59' - 04.29
e	30° - 00' - 30.00	30° - 00' - 30.07	30° - 00' - 30.48
f	25° - 59' - 54.72	25° - 59' - 54.85	25° - 59' - 53.12
Sum	180° - 00' - 00.00	180° - 00' - 00.00	180° - 00' - 00.00
g	83° - 27' - 37.65	83° - 27' - 37.72	
h	148° - 45' - 04.09	148° - 45' - 04.17	
i	128° - 47' - 18.49	128° - 47' - 18.61	
Sum	360° - 00' - 00.00	360° - 00' - 00.00	

Adjustment B. Geometric Condition. The sum of the angles in each of the three triangles are:

$$\text{(1)} \quad a + b + c = 180° - 00' - 00.43''$$
$$\text{(2)} \quad d + e + g = 180° - 00' - 00.32''$$
$$\text{(3)} \quad f + h + i = 180° - 00' - 00.39''$$

In triangle (1) the sum of a + b + c is greater than 180° by +0.43". If an equal correction were applied to each angle, the correction would be -0.14". Similarly, in triangles (2) and (3), the equal corrections would be -0.11" and -0.13". Applying these equal corrections to angles a, b and c, they can be found to differ from 360° by 0.00". In the same way the correction to angle d in and i is 0.10" and from this the correction to angle c is 0.05". Condition (2) is satisfied. The remaining discrepancy in each triangle is then distributed equally between the other two angles of each triangle, thus satisfying eqs. (1), (2) and (3).

Adjustment [illegible] logarithmic [illegible] the logarithmic sines of the angles as given by [illegible] indicated by [illegible] were recorded as shown in the following tabulation, [illegible] the tabular [illegible] for each angle.

[illegible]

Log sin [illegible]	[illegible]	[illegible]
Log sin [illegible]	[illegible]	[illegible]
Log sin [illegible]	[illegible]	[illegible]
	[illegible]	

Log sin [illegible]	[illegible]	[illegible]
Log sin [illegible]	[illegible]	[illegible]
Log sin [illegible]	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	
	[illegible]	

The difference between the two sums is [illegible] units of the seven places of logarithms used. This value, divided by 6, gives the average required change in log sine, [illegible]. The average tabular difference for 1" is 52.0 = β. Hence

$$\frac{\alpha}{\beta} = \frac{9.0}{52.0} =$$ [illegible] (nearly), which is the average correction to be applied to each angle. Obviously, it will be added to angles [illegible], and subtracted from angles a, [illegible], e.

Since this adjustment is applied [illegible] which are alternate angles, it does not disturb the geometric conditions. The final adjustment is given in the fourth column of the foregoing table.

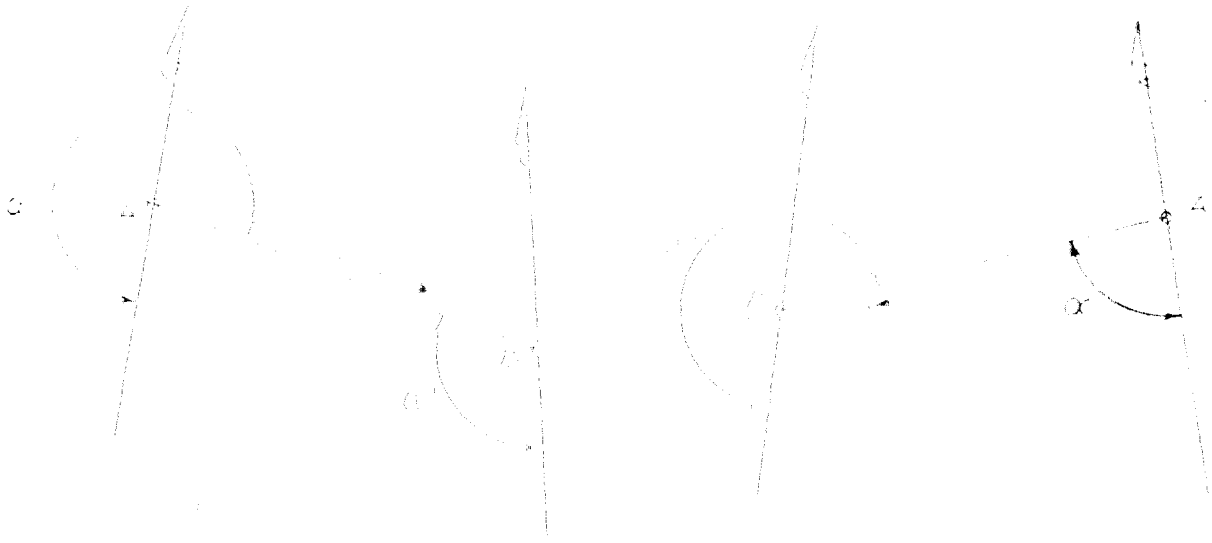


Fig. 1 — To find Latitude

Fig. 2 — To find Azimuth

Note: All west longitudes are given positive in tables.

To find Latitude: Use nearest star of magnitude 2.5 or brighter, the longitude is approximate, observe z_1 by theodolite in plane.

By inspection (Q.1 table) is Sun's or Star's (S) meridian altitude plus correction is applied to the observed altitude (O) to obtain the local altitude (Q.A). (Δλ) and (Δλ') are applied to Q.A.

To find Azimuth: Use correction of nearest star to z_1, the longitude is approximate, therefore (Δλ) is also approximate.

By inspection (Q.) or Sun's Hour Angle (t. Ang.) therefore a minor correction is applied to the observed azimuth (O) to obtain the local azimuth (Q.A). (Δλ) and (Δλ') are applied to this.

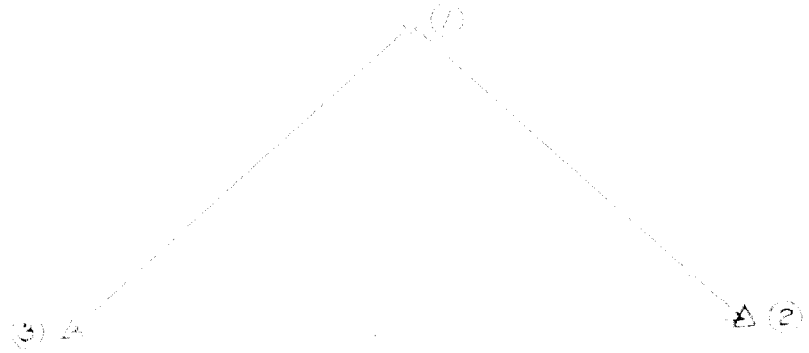
Note: In west longitudes the difference in longitude (Δλ) is subtracted, in minutes (Δλ') is applied as in Fig. 1.

To find Latitude — Fig. 3 — To find Azimuth

Note: All west longitudes are given positive.

To find Latitude: Use nearest star of magnitude 2.5 or brighter, the longitude is approximate, observe z_1 by theodolite in plane.

By inspection (Q.1 table) is Sun's or Star's (S) meridian altitude plus correction is applied to the observed altitude (O) to obtain the local altitude (Q.A). (Δλ) and (Δλ') are applied to Q.A.



HOLMES & NARVER, INC
ENGINEERS-CONSTRUCTORS

POSITION COMPUTATION SECOND ORDER TRIANGULATION

COMPUTED BY _____ DATE _____ B NO. _____ LOCATION _____

			(1)	216	27	56.7					(1)	36	31	17.9	
			(1)	40	39	20.2					(1)	52	41	23.6	
			(1)	263	27	16.9									
			(6)		04	29.3									
				53	31	46.2									
					40	39	21.5								
38	14	33.188				92	23	17.698		38	20	29.359			
	+	39.130	(4)			-	07	14.968			-05	06.741	(4)		
		32.318	(4)			92	16	02.730		38	15	22.318	(4)		
						38	15	02.8	(6)			3.9925695			
5.5109843						4.0271423				=		8.5109771			
1.5949888		-39.3540	(3)			9.9971600	(2)					2.4867481		+306.7242	(3)
3.05428						8.5091624	(5)					7.98514			
9.99432					Sec φ	0.1049921				Sin²		8.87183			
1.30133						2.6384568	-434.9675		(5)			1.30282			
9.34993		+0.2238	(3)		Sin φ	9.7917641						8.15979		2d term	+0.0144 (3)
3.1899						2.4302209	-269.29		(6)			4.9735			
2.3801												2.3804			
5.5700		0	(3)									2.3539		3d term	+0.0023 (3)
		-39.1302	(4)											- Δφ	+306.7409 (4)

PROBLEM IN EAST LONGITUDE

23 MARCH 1956

CONDITION OF TRIANGLES

Computation of the four triangles of an observed quadrangle is a required part of the field work to insure that it may be considered that the observed angles are within tolerances set up by the instructions. This is the first check on the accuracy of the observations to see that errors are within prescribed limits and that the requirements of the adjustment will be met.

In the quadrangle shown by the sketch the line MAX-CHARLIE is the base or known line. The expansion of the net is from the line AMIS-BOB as determined from this quadrangle. Two of the computations for the quadrangle are shown on the form which serves as the computation or permanent record.

The b_1 or strongest pair of triangles for use from the line AMIS-BOB are determined are entered first on the form for stations A and B, followed by the second best pair in sections C and D.

The individual triangles are always numbered in a clockwise direction with (1) at the new station and (2) and (3) at the stations on the known line. The line 2-3 is always the known line.

Computations are completed to the following order with figures rounded off to the closest hundredth for first order and to the closest tenth for second order triangulation.

(a) Enter the names of the stations and the observed angles in columns 1 and 2 corresponding with the number in pocket 1 of the individual triangles.

(b) The closing error of each triangle is distributed equally, or nearly so, between the three angles and entered in correction column 3 for angles which are determined by this operation. The correct sum of angles total 180°. It should be noted that this distribution of the closing error of the individual triangles does not satisfy the side equations of a quadrilateral adjustment but is of the first order of magnitude of a distribution differing from the correct application which cannot be satisfactory for the closure and final balancing of the angles are readjusted by the side equation adjustment or by more precise determination by the method of least squares.

(d) To complete the first triangle (A), enter logarithm 7, enter the logarithm of the known side Bc, the cologarithm of the log sin of 1 and the log sines of 2 and 3 (line 5 to the nearest logarithm 5-8, 1 and 2. Line 1- is the sum of the logarithms 5-8, 1 and 2, from the logarithm of 1-2 and 1-2 determine the triangle misclosure and enter it between (Complete the computation of triangles (B),(C) and (D) in the same manner.

(e) The spherical excess is computed from the formula $e = a, b, c, \times R$ where a, b, and c are the new sides and sin of the corresponding triangle. Three decimal places are sufficient in computing this quantity.

Obtain log e corresponding to the mean latitude of the quadrangle from S.P.no.8 page 10. To the log e add the log sin(s) of the angles 1-2, 2 and 1-3 taken from column 7. The sum is the logarithm of the spherical excess which is to be entered in column 8 on the following line and is usually nearly so, between the three angle. The correction to these per is added to the plane angles and entered in column 9.

Example — Triangle B

log e	1.402
log sin 1-2	9.999
" 2	9.999
log sin 1-3	4.182
log e	0.377 = 0.2"

The excess of 0.2" is distributed 0.1" each to one of the angles.

(e) The total correction to the observed angle is the difference between it and the spherical angle (column 6) the correction is plus or minus depending on whether the spherical angle is greater or smaller than the observed angle.

SIDE CHECKS. In the computation of a non-fixed quadrangle there are always three sides which have two determinations of their length, one of the requirements of first order triangulation is that the difference between the two values for the logarithm of the length of a side be no greater than two times the log sine difference for one second of the smallest distance angle involved in the computation of either value. Enter this value in the allowance for second side difference.

Referring to the following completed side check computation form:

Line A, 1-3	4.8000000	Diff. for 1" in 8th dec.	23
" B, 1-3	4.8000000		4
Actual diff.	00	Allowance for 2"	778
Line B, 1-3	4.8112200	Diff. for 1" in 8th dec.	41
" C, 1-3	4.8112200		4
Actual diff.	00	Allowance for 2"	164
Line B, 1-3	4.8112200	Diff. for 1" in 8th dec.	41
" D, 1-3	4.8112200		4
Actual diff.	00	Allowance for 2"	820

If this computation does not satisfy the conditions of the side check reobserving of one or more sections will be necessary. The most probable angles to reobserve may generally be determined by inspection of the computation or by applying a little care on first check. When conditions have been satisfied the quadrangle can be considered adjusted and the requirements as to further field work for triangulation of this type

23 MARCH 1956

COMPUTATION OF TRIANGLES

COMPUTED BY [illegible] DATE 8-1-56

STATION	OBSERVED ANGLE	CORRECTION	CORRECTED ANGLE	SIDES	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3					7494.90	3.8747533
1 ABLE	61 08 08.1	+ 0.5	61 08 08.6	0-3	08.0	3.9285782
2 NAN	57 [illegible]	+ 0.2	[illegible]	0-2	08.2	3.9951673
3 CHARLIE	61 43 48.2	+ 0.2	61 43 48.4	1-2	48.5	3.9572650
	180 00 [illegible]				9980.48	3.9984958
1-2					7494.90	3.8747533
2-3						3.9984958
1 DOG	64 20 [illegible]	+ 0.2	[illegible]	0-3	56.3	0.1543401
2 ABLE	55 [illegible]	+ 0.2	[illegible]	0-1	59.0	3.9988873
3 CHARLIE	61 [illegible]	+ 0.2	[illegible]	1-2	08.2	3.8204108
	180 00 [illegible]					
1-3					14161.08	4.1517262
1-2					9401.64	3.9732497
2-3						3.4747533
1 DOG	[illegible]	+ 0.2	[illegible]	0-3	56.3	0.0565036
2 NAN	57 [illegible]	+ 0.2	[illegible]	0-2	57.2	3.9404709
3 CHARLIE	61 [illegible]	+ 0.2	[illegible]	1-2	48.2	3.[illegible]
	180 00 [illegible]					
1-3					14161.08	4.1517727
1-2					9401.64	3.9732497
2-3						4.1[illegible]
1 ABLE	[illegible]	+ 0.2	[illegible]	0-3	08.3	0.[illegible]
2 NAN	[illegible]	+ 0.2	[illegible]	0-2	14.0	3.[illegible]
3 DOG	[illegible]	+ 0.2	[illegible]	1-2	48.2	3.[illegible]
	180 00 [illegible]					
1-3					[illegible]	3.[illegible]
1-2					[illegible]	3.[illegible]

(1) (2) (3) (4) (5) (6) (7)

184

HOLMES & NARVER, INC.

ENGINEERS - CONSTRUCTORS

SURVEY DEPARTMENT

DESCRIPTION & RECOVERY

of

TRIANGULATION STATIONS

[illegible]

For establishment of a new station, at least two and preferably three reference marks should be established. The marks should be 3/8" dia. brass, or other non-ferrous metal marker, scored across [illegible]. The station mark should be stamped with the name of the station, U.S.B.M. and the year it is established. The reference point should be a punch mark as near the center of the marker as possible. This mark should be [illegible] to describe in such a way that it cannot be easily disturbed. Ideally a drilled hole would permit this; however, the ideal monument would be a 1" x 3" concrete pillar set to the depth of the frost line underlying the island soil. The reference mark should be a non-ferrous metal with a surface large enough to stamp the following on it: U.S.B.M. (3 or 4 lines) - the station name, U.S.B.M. and the date it is established. A 1" corrosion resistant brass marker is most desirable, but a large round or hexagon head brass screw or pipe cap is also acceptable. This marker should be set in a concrete post at least 3 feet in the blue mud for the station mark, or possibly less for hard rock. It should extend above and back in either a concrete slab or the rock be used, a small area 6 or [illegible] a brass escutcheon pin) should be used and the head of the pin should be large enough to stamp the required data on it.

When the station and the reference marks have been established, a complete description should be prepared containing the following items:

(1) A photo description of the station area and the RM's including what type of marker was used, how it is marked, and how it is set (concrete, grouted into a ridge, rock, etc.).

(2) A sketch of the station location to be added to publish to hide line, trees, and outstanding features or structures.

(3) A measurement of the angle at the station point to each of the reference marks from an existing station, or another station (preferably the control point station (Corral or Redoubt Rock), bay at PD) or a prominent landmark whose coordinate location is known.

(4) The measured distance from the station mark to each of the Reference Marks and the azimuth between the reference marks.

(5) The elevations of the station mark and reference marks. If no elevations are available to classify the stations, an estimate should be obtained from field observations and noted for that purpose. If no data should be entered else must be used.

(6) A brief description of the station, the equipment and methods used in making the measurements as prescribed in (3) and (4).

Where at all possible the station mark should be connected with a triangulation or wooden barrierade and the reference marks placed 2 to 4 feet on the right away from the station mark.

RECOVERY OF AN EXISTING STATION

The purpose of station recovery is to ascertain accurately the availability of an existing triangulation station using the latest and verified location already available without additional field work and to provide a check on any possible future loss or change in the station characteristics to enable it to be used without further field work.

All previous recovery notes and station descriptions should be made available to the person making the recovery to insure a full and complete recovery of the station.

When the station has been found with the help of data corresponding to that required in the preceding section, the following procedure should be obtained. This data should be obtained by as near the same means and using as near the same methods and equipment as were used in the latest station description or survey. These values should be recorded on a Permanent Mark Identification Station form which is very similar to the description of triangulation Station form. Any differences in measured values from previous values should be checked and, if found to be actual changes, should be noted. If any changes in the features of the location which might be used for referencing the station should be noted in

the recovery note and a sketch of the location by content to the sketch required for the Public Information Report [illegible] be added to the description. "

In the event a station or reference mark has been disturbed or damaged in any way, no attempt to correct that should be made on the initial recovery mission. Instructions for correcting changes, discrepancies etc. will be issued by the survey office after evaluation of the initial recovery notes from the field. When instructions or changes, deletions, etc. are issued, they will be issued in conformity with U. S. C. & G. S. procedures as outlined in U. S. C. & G. S. Spec. modified to fit details as [illegible]

FIELD NOTES

Survey Department

1. A record must be made of all field survey work in a duplicating Field Book. There are no exceptions. In some parties, such as, plane table work, in which the actual work performed is not entered in the Field Book, a Field Book entry must be prepared as mentioned in Paragraphs 9 and 11. The data not recorded in a Field Book must show the same information as the Field Book entry.

2. Two Field Books will be carried by each party Chief. One book will be used for all Domestic (non-scientific) work, the other for Scientific work.

3. In Scientific work, Stations are referred to by number (i.e. not as shot tower, detector, etc.).

4. In Domestic work, all Buildings are referred to by number (i.e. not as mess-hall, water tower, etc.).

5. In both Domestic and Scientific work it is extremely important to show elevations of structures. Unless specifically directed otherwise, this should be in relation to the site datum. The notes must include all the details of the work.

6. Angles turned must show actual details, such as, initial, double or six, and mean. Generally, no pre-planned angles will be shown. Should it be desirable to show pre-planned angles, they should be clearly labeled as such.

7. Distances measured must show actual details, such as, forward and back measurements, equipment, marks, slope, sighting, balance, etc.

8. Sketches are used to clarify the work performed. When deciding whether one is necessary, remember that the notes will be processed and used by others not as familiar with the circumstances as you may be. Label all points shown and use a north arrow.

9. The first line of the left hand page must show specific location and type of work. Examples: Building 204, Interior Layout; Station 120, W.P. location; Warehouse Area, Topography, Station 120, Levels. On the second line show the site's or its current code name, such as, Site Elmer. For work located near a site name (Elmer), such as, Elmer Reef, Sites Elmer-Fred Camp.

10. When continuous pages in the same Field Book are used, it is not necessary to repeat the listing between the initial and the first right hand page used must show "continued on page _____". On following pages, each one must show "continued from page _____" and "continued on page _____" at the bottom of the right hand page, except the bottom of the last page used shall show "End of survey". In case the pages used are not in sequence in the Field Book or are in different books, the title shall appear on each page.

11. The first line on the right half of the right hand page is used for the date and general [illegible] succeeding lines [illegible] the names of the party, state of the weather and the time of starting and stopping work.

12. An index shall be kept on the first page of each Field book, in the following manner:

PAGE	DESCRIPTION	SITE
[illegible]	Station 340, U. S. [illegible]	Ruby
[illegible]	Station 340, [illegible]	Ruby

13. Field Book originals must be turned in daily to the Survey Office.

14. ALL FIELD NOTES [illegible] THERE ARE NO EXCEPTIONS.

M. P. Curran, Jr.
16 August 1956

FIELD NOTE HANDLING

Field Note original pages (white sheets) are indexed immediately after arriving at the office. They are then thoroughly checked for accuracy and completeness. If the checker finds them unsatisfactory, he returns them to the Chief of Party with a note attached stating the details in question.

When the Field Note originals have been checked and found satisfactory, the checker turns them over to the Department Head. The latter assigns them to a computer or draftsman for necessary action, such as, preparing tabulations, drawings, etc. After all necessary action has been taken, the Field Note originals are filed in the binder labeled with the Field Book number corresponding to that of the Field Notes. At this time a note is made on the Field Note pages in red pencil stating what action was taken.

If no one is available to take the necessary action, the Department Head makes an entry in a pending file. This file is reviewed daily.

When the Chief of Party has used all of the pages in a Field Book from 2 to 30 inclusive, he turns in the Field Book Index kept on Page 1. The Field Book originals are checked and the Chief of Party called to account for any missing pages.

The Index of Field books consists of 3 x 5 inch cards kept in a standard metal file box. A Domestic and a Scientific File is kept for each Atoll. These are subdivided as follows:

DOMESTIC

SITE

Buildings	Numerical order
Roads	Alphabetical order
Sewers	Alphabetical order
Water Lines Electrical (Underground) Electrical (Overhead)	Alphabetical order of sheets of Site Plan
Topography	Separate when not directly related to any of above subdivisions
Hydrography	Separate when not directly related to any of above subdivisions
Marine Facilities	Separate when facility does not carry a building number
Horizontal Control	Chronological order
Vertical Control	Chronological order

SCIENTIFIC

Numerical

Station numbers and files only on Department cards

Files

Stations	Numerical order
Cables	Files established for each type

When the Field Note contains no more than one page of entry, a note is made on each

EARTHWORK COMPUTATIONS

COMPUTED BY _____ DATE _____ JOB _____ LOCATION _____

CHECKED BY _____ DATE _____ SHEET _____ OF _____

STATION	DISTANCE	EXCAVATION AREA SQ. FT.	EXCAVATION $\frac{1}{2}(A+A')$	EXCAVATION CUBIC YARDS	EMBANKMENT AREA SQ. FT.	EMBANKMENT $\frac{1}{2}(A+A')$	EMBANKMENT CUBIC YARDS
TOTALS (THIS SHEET)				CUT			FILL
TOTALS BROUGHT FORWARD							
CUMULATIVE TOTALS							

SUR/

HOLMES & NARVER, INC.
ENGINEERS - CONSTRUCTORS

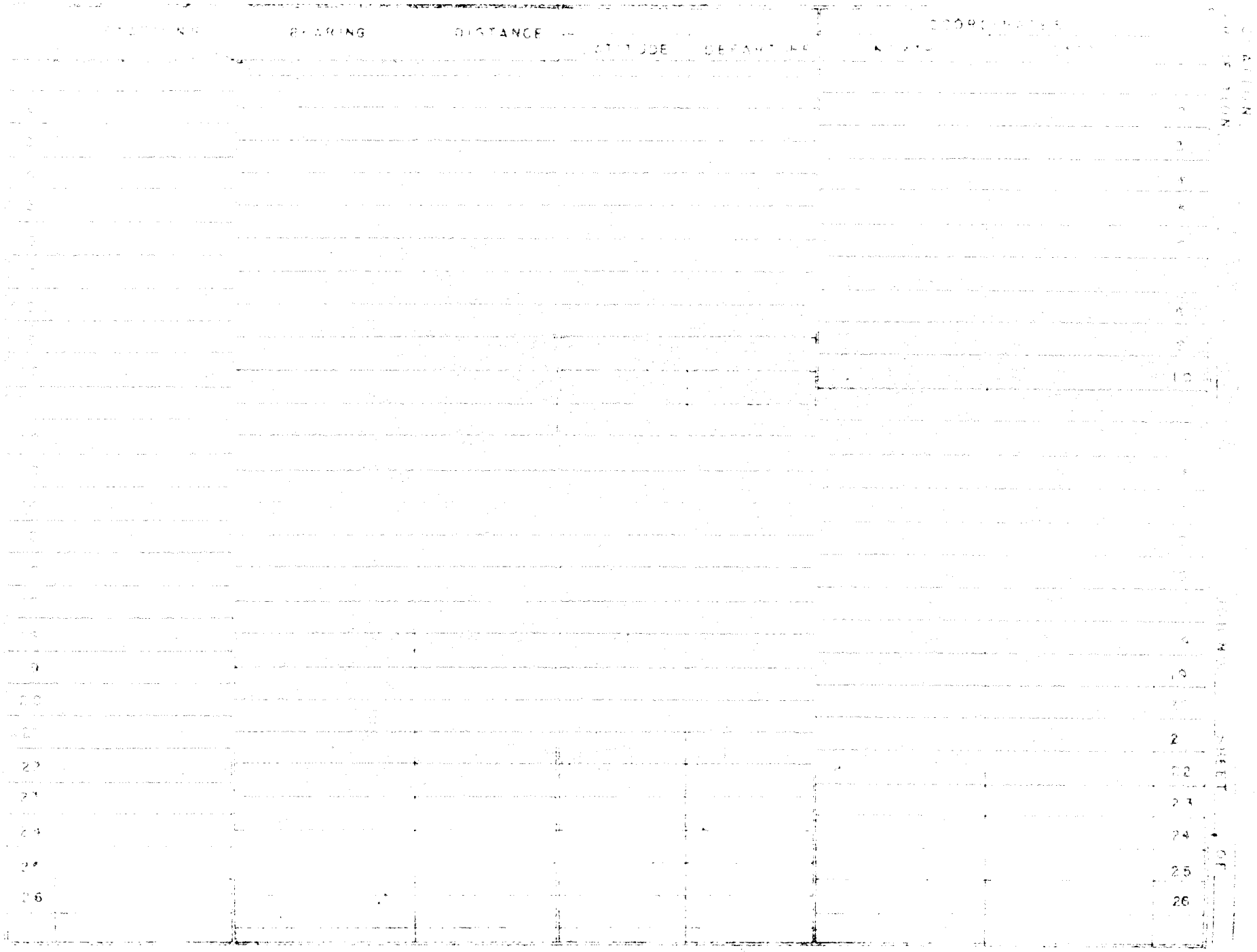
EARTHWORK COMPUTATIONS

COMPUTED BY ____ DATE ____ JOB NO. ____ LOCATION ____

CHECKED BY ____ DATE ____ SHEET ____ OF ____

		EXCAVATION			EMBANKMENT		
STATION	DISTANCE	AREA SQ. FT.	$\frac{1}{2}(A+A')$	CUBIC YARDS	AREA SQ. FT.	$\frac{1}{2}(A+A')$	CUBIC YARDS
TOTALS (THIS SHEET)			CUT			FILL	
TOTALS BROUGHT FORWARD							
CUMULATIVE TOTAL							

Supl



PLANE COORDINATES

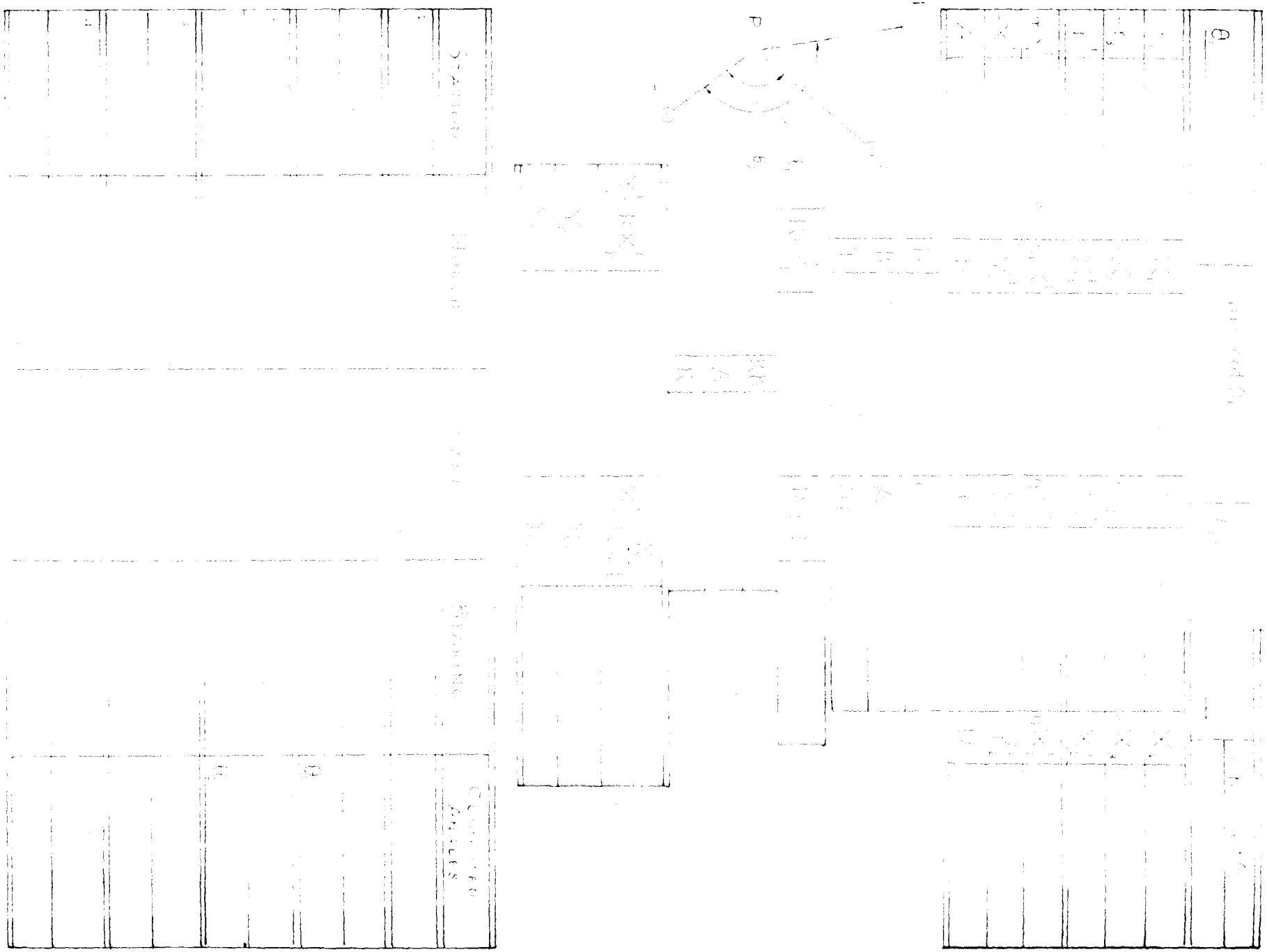
LOCATION

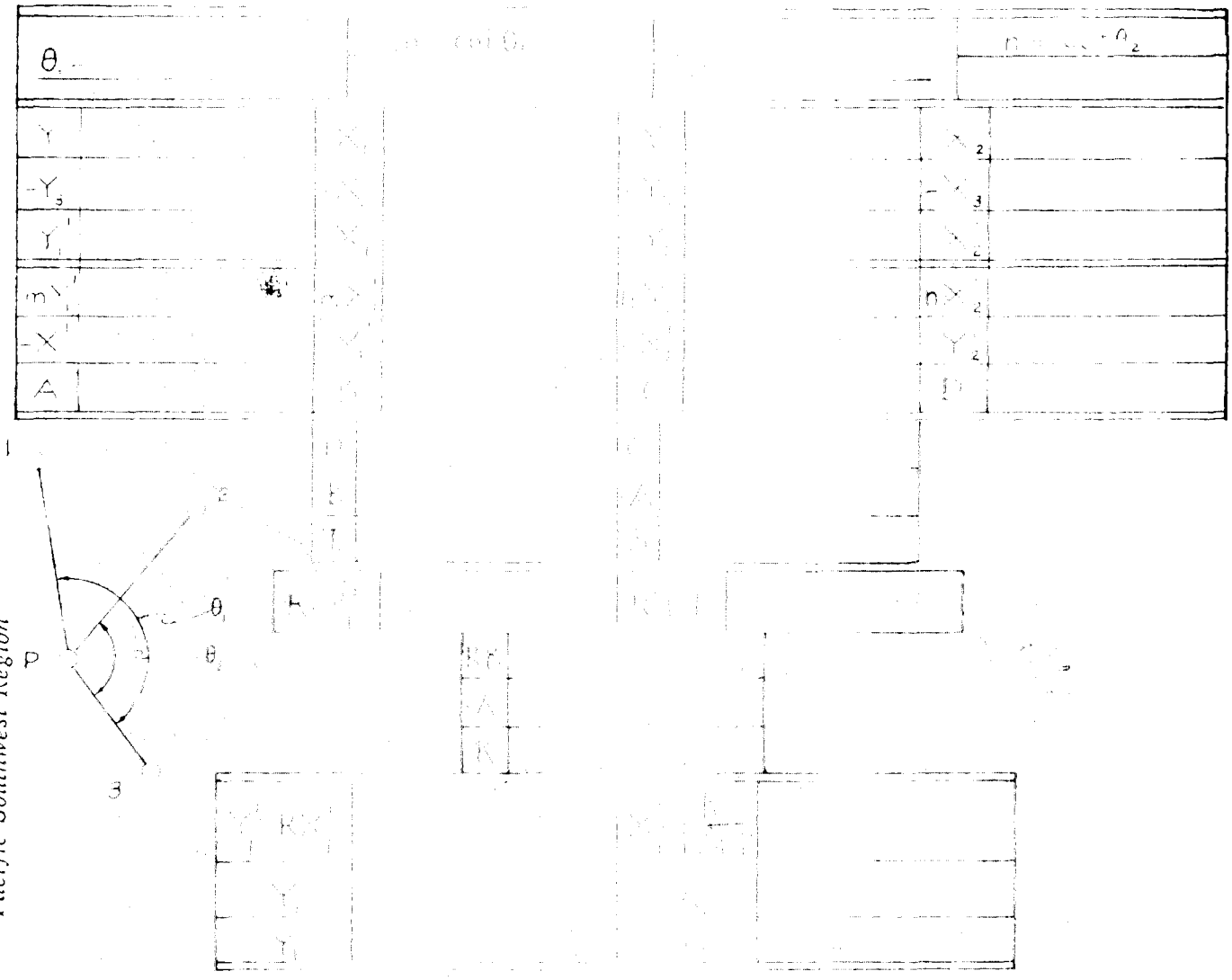
PROJECTION

STATIONS	BEARING	DISTANCE	LATITUDE	DEPARTURE	COORDINATES NORTH	COORDINATES EAST

SHEET NO.

OF





Station	Bearing	Computed Angles
P		
		θ
2		
		θ_2
3		
4		

JOB NO _____

HOLMES & NAEYER ENGINEERS

COMPUTATION OF TRIANGLES

COMPUTED BY _____ CHECKED BY _____ DATE _____

STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANG.	SPHERICAL EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3						
1						
2						
3						
3						
1-2						
2-3						
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						

JOB NO. ____

HOLMES & NARVER INC. ENGINEERS

COMPUTATION OF TRIANGLES

COMPUTED BY ____________ CHECKED BY ____________ DATE ________

STATION	OBSERVED ANGLE	CORR-N	SPHERCL ANGLE	SPHERCL EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						

HOWARD P. FAIRFIELD, INC., ENGINEERS

ABSTRACT OF WYE LEVELS AND COMPUTATION OF INCLINATION CORRECTIONS.

STA.	DIST. BASED	NEAREST DIST.	INCLINATION CORR.	ELEVATION	ADJ. ELEVATION	REMARKS

HOLMES & NARVER INC., ENGINEERS

JOB Nº

ABSTRACT OF WYE LEVELS AND COMPUTATION OF INCLINATION CORRECTIONS.

POINT	DISTANCE	MEAN DIFF. OF ELEV.	INCLINATION CORRECTION	ELEVATION	MEAN ELEVATION	REMARKS
	METERS	METERS-FEET	M.M.	METERS	METERS	

HOWARD & MARSH CIVIL ENGINEERS JOB NO ____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER ____ INST. NO. ____ STATION ____

RECORDER ____ DATE ____ SET NO ____

POSITION	STATIONS OBSERVED	TIME	D M S	CIRCLE READING	MEAN	DIRECTION	REMARKS

SURVEY

HOLMES & NARVER INC., ENGINEERS JOB NO.____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER_____ INST. NO._____ STATION_____

RECORDER_____ DATE_____ SET NO._____

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
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			D				
			R				
			D				
			R				

DAILY REPORT

JOB NO. _____ LOCATION _____ DATE _____

WORK REQUESTS	WORK STARTED OR COMPLETED	REMARKS

SIGNED _____

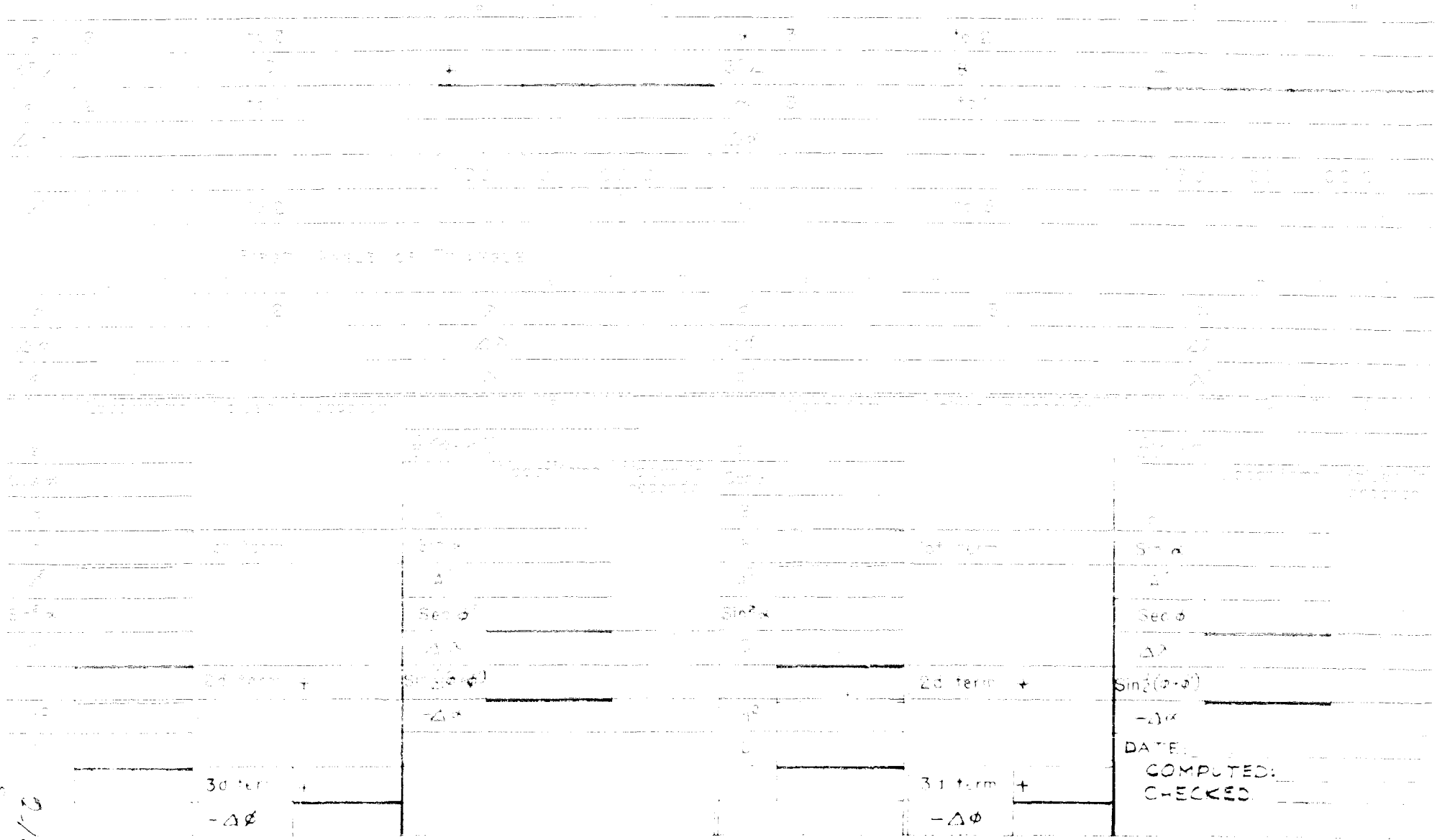
Sup 7

REMARKS	WORK REQUESTS	WORK STARTED OR COMPLETED	JOB NO.

HOLMES & NARVER INC., ENGINEERS

JOB Nº ____

POSITION COMPUTATION SECOND ORDER TRIANGULATION



JOB No ____

HOLMES & NARVER INC., ENGINEERS

POSITION COMPUTATION SECOND ORDER TRIANGULATION

			°	'	"					°	'	"
α	2	to 3				α	3	to 2				
$3^d\angle$		8	+			$3^d\angle$		8	−			
α	2	to 1				α	3	to 1				
$\Delta\alpha$						$\Delta\alpha$						
			180	00	00.0					180	00	00.0
		to 2				α'	1	to 3				

FIRST ANGLE OF TRIANGLE

	°		°	'	"					°	'	"
ϕ		2	λ				ϕ		3	λ		
$\Delta\phi$			$\Delta\lambda$				$\Delta\phi$			$\Delta\lambda$		
			λ'				ϕ'		1	λ'		

				°	'	"		Logarithms	Values in seconds
			$\frac{1}{2}(\phi+\phi')$				s		
				Logarithms	Values in seconds		Cos α		
B			s				B		
		1st term	Sin α			"	h		1st term "
s^2			A′				s^2		
$\sin^2\alpha$			Sec ϕ'				$\sin^2\alpha$		
C			$\Delta\lambda$			"	C		
		2d term +	$\sin\frac{1}{2}(\phi+\phi')$						2d term +
h^2			$-\Delta\alpha$				h^2		
D							D		
		3d term +							3d term +
		$-\Delta\phi$							$-\Delta\phi$

			°	'	"		Logarithms	Values in seconds
			$\frac{1}{2}(\phi+\phi')$					
				Logarithms	Values in seconds			
			s					
		1st term	Sin α			"		
			A′					
			Sec ϕ'					
			$\Delta\lambda$			"		
		2d term +	$\sin\frac{1}{2}(\phi+\phi')$					
			$-\Delta\alpha$					
			DATE:					
			COMPUTED:					
			CHECKED:					

Sue 8 2/11

HOLMES & NARVER INC - ENGINEERS CONSTRUCTORS

COMPUTATION OF BASE LINE

CALC BY CHKD BY DATE JOB NO LOCATION

SECTION	DATE	DIR OF MEAS	TAPE NO	SUP-PORT	INCORR LENGTH NO	INCORR LENGTH METERS	TEMP	CORRECTIONS TEMP	CORRECTIONS SLOPE SET-BACK	CORRECTIONS INCLINATION	CORRECTIONS SEA LEVEL	REDUCED LENGTH	ADOPTED LENGTH
							°C	METERS	METERS	METERS	METERS	METERS	METERS-FEET

C/S

HOLMES & NARVER INC.-ENGINEERS CONSTRUCTORS

COMPUTATION OF _____ BASE LINE

CALC BY _____ CHKD BY _____ DATE _____ JOB NO _____ LOCATION _____

SECTION	DATE	DIR OF MEAS	TAPE NO	SUP-PORT	UNCORR. LENGTH		TEMP	CORRECTIONS				REDUCED LENGTH	ADOPTED LENGTH
					NO	METERS		TEMP	SET-UP SET-BACK	INCLINATION	SEA LEVEL		
							"C"	METERS	METERS	METERS	METERS	METERS	METERS-FEET

ROBERT E. RAMEY — REGISTERED PROFESSIONAL ENGINEER

RECOVERY NOTE — TRIANGULATION STATION

NAME OF STATION _____ LOCATION _____ JOB NO _____

ESTABLISHED BY _____

RECOVERED BY _____ DATE _____ FIELD BOOK REF _____

OBJECT	DISTANCES AND DIRECTION FROM REFERENCE MARKS				
	DISTANCES FEET	METERS	DIRECTION	AZIMUTH	ELEV

DETAILED DESCRIPTION OF STATION

HOLMES & NARVER ENGINEERS-CONSTRUCTORS

RECOVERY NOTE TRIANGULATION STATION

NAME OF STATION_____ LOCATION_____ JOB NO._____

ESTABLISHED BY_____

RECOVERED BY_____ DATE_____ FIELD BOOK REF._____

DISTANCES AND DIRECTIONS TO REFERENCE MARKS					
OBJECT	DISTANCE		DIRECTION	AZIMUTH	ELEV.
	FEET	METERS			

DETAILED DESCRIPTION OF STATION

HOLMES & NARVER INC. ENGINEERS · CONSTRUCTORS

GEOGRAPHIC POSITIONS

LOCATION _____ ORDER TRIANGULATION

DATUM _____ JOB NO _____ SHEET _____ OF _____

STATION	LATITUDE / LONGITUDE	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE LOG METERS	DISTANCE METERS	DISTANCE FEET

2-1 6

HOLMES & NARVER INC. - ENGINEERS - CONSTRUCTORS

GEOGRAPHIC POSITIONS

LOCATION _____ ORDER - TRIANGULATION

DATUM _____ JOB NO. _____ SHEET _____ OF _____

STATION	LATITUDE / LONGITUDE	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE METERS	DISTANCE FEET

CORRECT[illegible] [illegible] [illegible]VAT[illegible] [illegible] REFRACTION

Height (in ft.) = Dist (in miles) x 0.57[illegible]   Dist (in miles) = √Height (in ft.) x 1.32

TENTHS

		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0				0.1	[illegible]	0.1	0.2	0.3	0.4	0.5
1	0.6	0.7	0.8	1.0	1.[illegible]	1.3	1.5	1.7	1.9	2.1
2	2.3	2.5	2.[illegible]	3.0	3.3	3.6	3.9	4.2	4.5	4.8
3	5.2	5.5	5.9	6.3	6.6	7.0	7.4	7.9	8.3	8.7
4	9.2	9.6	10.1	10.6	11.1	11.6	12.1	12.7	13.2	13.8
5	14.4	14.9	15.5	16.1	16.7	17.4	18.0	18.6	19.3	20.0
6	20.6	21.4	22.1	22.8	23.5	24.3	25.0	25.8	26.6	27.3
7	28.1	28.9	29.8	30.6	31.4	32.3	33.2	34.0	34.9	35.8
8	36.7	37.7	38.6	39.5	40.[illegible]	41.5	42.5	43.4	44.5	45.5
9	46.5	47.5	48.6	49.6	50.[illegible]	51.8	52.9	54.0	55.1	56.3
10	57.4	58.5	59.7	60.9	62.[illegible]	63.3	64.5	65.7	66.9	68.2
11	69.4	70.7	72.[illegible]	73.3	74.6	75.9	77.2	78.6	79.9	81.3
12	82.6	84.0	85.4	86.8	88.2	89.7	91.1	92.6	94.0	95.5
13	97.0	98.5	100[illegible]	101.5	103.[illegible]	104.6	106.1	107.7	109.3	110.9
14	112.5	114.1	115.7	117.3	119.[illegible]	120.6	122.3	124.0	125.7	127.4
15	129.1	130.8	132.6	134.3	136.1	137.9	139.6	141.4	143.3	145.1
16	146.9	148.7	150.6	152.5	154.[illegible]	156.2	158.1	160.0	162.0	163.9
17	165.8	167.8	169.8	171.7	173.[illegible]	175.7	177.8	179.8	181.8	183.9
18	185.9	188.0	190.1	192.2	194.3	196.4	198.5	200.7	202.8	205.0
19	207.2	209.3	211.[illegible]	213.7	216.[illegible]	218.2	220.4	222.7	225.0	227.2
20	229.5	231.8	234.1	236.5	238.8	241.2	243.5	245.9	248.3	250.7
21	253.1	255.5	257.[illegible]	260.3	262.8	265.3	267.7	270.2	272.7	275.2
22	277.7	280.3	282.[illegible]	285.4	287.[illegible]	290.5	293.1	295.7	298.3	300.9
23	303.6	306.2	308.[illegible]	311.5	314.[illegible]	316.9	319.6	322.3	325.0	327.8
24	330.5	333.3	336[illegible]	338.8	341.[illegible]	344.4	347.3	350.1	352.9	355.8
25	358.6	361.5	364.4	367.3	37[illegible]	373.[illegible]	376.1	379.0	382.0	384.9
26	387.9	390.9	39[illegible]	396.9	[illegible]	403.0	406.0	409.1	412.2	415.2
27	418.3	421.4	42[illegible]	427.[illegible]	43[illegible]	434.[illegible]	437.1	440.3	443.5	446.7
28	449.9	453.1	4[illegible]	45[illegible].6	4[illegible]	466.[illegible]	469.4	472.7	476.0	479.3
29	482.6	48[illegible].9	48[illegible]	492.6	496.[illegible]	499.4	502.8	506.2	509.6	513.0
30	516.4	519.9	52[illegible].4	526.8	530.3	533.8	537.31	540.8	544.4	547.9
31	551.4	555.0	55[illegible]	562.2	565.8	569.4	573.0	576.6	580.3	583.9
32	587.6	59[illegible].3	59[illegible]	598.7	602.4	606.1	60[illegible].8	613.6	617.4	621.1
33	624.9	628.7	63[illegible]	636.3	640.[illegible]	644.[illegible]	647.8	651.7	655.6	659.5
34	663.3	667.3	67[illegible]	675.1	679.[illegible]	68[illegible]	687.0	690.9	694.9	698.9
35	703.0	707.0	71[illegible]	715.0	[illegible]	723.2	727.3	731.3	735.4	739.6
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9

S-37

(0.5738333)

2/8 Sue 13

S-34

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 68°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	
66 70	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
64° 72	192	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
[illegible] 74	[illegible]	[illegible]	641	897	1153	1410	1666	1923	2179	2436	2692	2948	3205	3461	3717	3974
60 76	[illegible]	288	480	673	865	1057	1250	1442	1634	1826	2019	2211	2403	2596	2788	2980
[illegible] 78	[illegible]	[illegible]	384	538	692	846	1000	1153	1307	1461	1615	1769	1923	2076	2230	2384
[illegible] 80	64	192	320	448	576	705	833	961	1089	1217	1346	1474	1602	1730	1858	1987
[illegible] 82	54	164	274	384	494	604	714	824	934	1043	1153	1263	1373	1483	1593	1703
52 84	48	144	240	336	432	528	626	721	817	913	[illegible]	1105	1201	1298	1394	1490
50 86	43	128	213	299	384	470	555	641	726	811	897	982	1068	1153	1239	1324
48° 88	[illegible]	[illegible]	192	269	346	423	500	576	653	730	[illegible]	884	961	1038	[illegible]	1192
46 90	[illegible]	104	174	244	314	384	454	524	594	664	[illegible]	804	874	944	1013	1083
44 [illegible]	[illegible]	[illegible]	[illegible]	224	288	352	416	480	544	[illegible]	[illegible]	[illegible]	801	865	[illegible]	993
[illegible] 94	[illegible]	[illegible]	147	[illegible]	266	325	384	443	502	562	[illegible]	[illegible]	739	798	857	917
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	741	[illegible]	[illegible]
[illegible] 98	[illegible]	[illegible]	128	179	230	282	333	384	435	487	538	589	641	692	743	794
[illegible] 100	24	72	120	168	216	264	312	360	408	456	504	552	600	649	697	745
34° 102	22	67	113	158	203	248	294	339	384	429	475	520	565	610	656	701
32° 104	21	64	106	149	192	235	277	320	363	405	448	491	534	576	619	662
30° 106	20	60	101	141	182	222	263	303	344	384	425	465	506	546	587	627
28° 108	19	57	96	134	173	211	250	288	326	365	403	442	480	519	557	596
26° 110	18	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
24° 112	17	52	87	122	157	192	227	262	297	332	367	402	437	472	506	541
22° 114	16	50	83	117	150	183	217	250	284	317	351	384	418	451	484	518
20° 116	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
18° 118	15	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
16° 120	14	44	73	103	133	162	192	221	261	281	310	340	369	399	428	458

219

Sue/14

CHORD AND DEFLECTION TABLE FOR CURVES OF STANDARD RADII

CHORD = 2R X SIN (DEFL FOR 1 ARC LENGTH)

DEFL FOR 1' OF ARC = $\frac{1718.8733}{R}$

RADIUS	LENGTH OF ARC	DEFLECTION FOR ONE ARC LENGTH	CHORD	DEFLECTION FOR A ONE FOOT ARC
[illegible]	25	9°-32'-57.5"	24.884	22.91831'
[illegible]	"	7°-09'-43.1"	24.935	17.18873'
[illegible]	"	5°-43'-46.5"	24.958	13.75009'
[illegible]	"	4°-46'-28.7"	24.971	11.45916'
[illegible]	"	4°-05'-33.2"	24.979	9.82213'
[illegible]	"	3°-34'-51.6"	24.984	8.59437'
[illegible]	"	3°-10'-59.2"	24.987	7.63944'
[illegible]	"	2°-51'-53.2"	24.990	6.87549'
[illegible]	"	2°-36'-15.7"	24.991	6.25045'
[illegible]	"	2°-23'-14.4"	24.993	5.72958'
[illegible]	50	4°-24'-26.5"	49.951	5.28884'
[illegible]	"	4°-05'-33.2"	49.958	4.91107'
[illegible]	"	3°-49'-11.0"	49.963	4.58356'
[illegible]	"	3°-34'-51.6"	49.967	4.29718'
[illegible]	"	3°-22'-13.2"	49.971	4.04441'
450	"	3°-10'-59.2"	49.974	3.81972'
[illegible]	"	3°-00'-56.0"	49.977	3.61868'
500	"	2°-51'-53.2"	49.979	3.43776'
[illegible]	"	2°-43'-42.1"	49.981	3.27404'
550	"	2°-36'-15.7"	49.983	3.12522'
[illegible]	"	2°-29'-28.0"	49.984	2.98934'
600	"	2°-23'-14.4"	49.986	2.86479'
700	"	2°-02'-46.6"	49.989	2.45553'
800	"	1°-47'-25.8"	49.992	2.14859'
900	"	1°-35'-29.6"	49.994	1.90986'
1000	"	1°-25'-56.6"	49.995	1.71887'
1100	"	1°-18'-07.8"	49.995	1.56261'
1200	"	1°-11'-37.2"	49.996	1.43239'
1300	"	1°-06'-06.6"	49.996	1.32221'
1400	"	1°-01'-23.3"	49.997	1.22777'
1500	"	0°-57'-17.8"	49.997	1.14592'
1600	"	0°-53'-42.9"	49.998	1.07430'
1700	"	0°-50'-33.3"	49.998	1.01110'
1800	"	0°-47'-44.8"	49.998	0.95493'
1900	"	0°-45'-14.0"	49.998	0.90467'
2000	"	0°-42'-58.3"	49.998	0.85944
2250	"	0°-38'-11.8"	49.998	0.76394'
2500	"	0°-34'-22.6"	49.998	0.68765'
2750	"	0°-31'-15.1"	49.999	0.62504'
3000	"	0°-28'-38.6"	49.999	0.57296'
3250	"	0°-26'-26.6"	49.999	0.52888'
3500	"	0°-24'-33.8"	49.999	0.49111'
3750	"	0°-22'-55.1"	50.000	0.45837'
4000	"	0°-[illegible]'-39.2"	50.000	0.42972'
4250	"	0°-20'-13.3"	50.000	0.40444'
[illegible]	"	0°-19'-05.9"	50.000	0.38197'
4750	"	0°-[illegible]'-[illegible]"	50.000	0.36187'
5000	"	0°-[illegible]'-[illegible]"	50.000	0.34377'
5500	"	0°-[illegible]'-[illegible]"	50.000	0.31252'
[illegible]	"	0°-[illegible]'-[illegible]"	50.000	0.28648'

S-35

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 84°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
82° 86	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
80° 88	132	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
78° 90	128	384	641	897	1153	1410	1666	1923	2179	2436	2692	2948	3205	3461	3717	3974
76° 92	[illegible]	288	480	673	865	1057	1250	1442	1634	1826	2019	2211	2403	2596	2788	2980
74° 94	[illegible]	[illegible]	384	538	[illegible]	846	1000	1153	1307	1461	1615	1769	1923	2076	2230	2384
72° 96	4	[illegible]	320	448	[illegible]	705	833	961	1089	1217	1346	1474	1602	1730	1858	1987
[illegible] 98	4	84	174	384	494	604	714	824	934	1043	1153	1263	1373	1483	1593	1703
68°100	[illegible]	144	240	336	432	528	625	721	817	913	[illegible]	1105	1201	1298	1394	1490
66°102	[illegible]	[illegible]	213	299	384	470	555	641	726	811	897	982	1068	1153	1239	1324
64°104	[illegible]	[illegible]	192	269	346	423	500	576	653	730	807	884	961	1038	1115	1192
[illegible] 6	[illegible]	4	74	144	214	284	464	624	554	664	734	804	874	944	1013	1083
[illegible] 08	[illegible]	[illegible]	160	224	288	352	416	480	544	608	673	[illegible]	801	865	929	993
[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	325	384	443	502	[illegible]	[illegible]	0	739	798	857	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31	686	41	796	851
[illegible] 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	282	333	384	435	487	538	589	641	692	743	794
[illegible] 16	[illegible]	[illegible]	[illegible]	[illegible]	316	264	312	360	[illegible]	456	504	[illegible]	600	649	697	745
[illegible] 18	[illegible]	[illegible]	113	158	203	248	294	339	384	429	475	520	565	610	656	701
48°120	[illegible]	84	106	149	192	235	277	320	363	405	448	491	534	576	619	662
[illegible] 22	[illegible]	[illegible]	[illegible]	141	182	222	263	303	344	384	425	465	506	546	587	627
44°124	10	[illegible]	96	134	173	211	250	288	326	365	403	442	480	519	557	596
42°126	18	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
40°128	17	52	87	122	157	192	227	262	297	332	867	402	437	472	506	541
38°130	[illegible]	[illegible]	83	117	150	183	217	250	284	317	351	384	418	451	484	518
36°132	[illegible]	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
34°134	15	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
32°136	14	44	73	103	133	162	192	221	251	281	310	340	369	399	428	458

Sur 16

GRADE SHEET

CALC. BY

CHECKED BY DATE

JOB NO

LOCATION

STA.	GRADE	ELEV.	CUT	FILL	STA.	GRADE	ELEV.	CUT	FILL

HOLMES & NARVER, INC ENGINEERS

GRADE SHEETS

CALC. BY ______ JOB NO ______

CHECKED BY ______ DATE ______ LOCATION ______

STA.	GRADE	ELEV	CUT	FILL	STA.	GRADE	ELEV.	CUT	FILL

223
SUR 17

HOLMES & NARVER INC., ENGINEERS

JOB NO.

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION

LOCATION

CHIEF OF PARTY

DATE

DISTANCES AND DIRECTIONS TO REFERENCE MARKS

OBJECT	DISTANCE		DIRECTION	AZIMUTH
	METERS	FEET		

ELEV. OF MARK ABOVE MEAN

HEIGHT OF TELESCOPE ABOVE MARK

HEIGHT OF LIGHT ABOVE MARK

DETAILED DESCRIPTION

DESCRIBED BY

MARKED BY

234

HOLMES & NARVER INC., ENGINEERS

JOB NO_____

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION_____ LOCATION_____

CHIEF OF PARTY_____

DATE_____

DISTANCES AND DIRECTIONS TO REFERENCE MARKS				
OBJECT	DISTANCE		DIRECTION	AZIMUTH
	METERS	FEET		

ELEV. OF MARK ABOVE MLWS._____

HEIGHT OF TELESCOPE ABOVE MARK_____

HEIGHT OF LIGHT ABOVE MARK_____

DETAILED DESCRIPTION:

DESCRIBED BY:_____ MARKED BY:_____

225

Degree						Minutes		Seconds	
0°	0.0000000000	60	1.0000000000	120°	2.0000000000	0′	0.0000000000	0″	0.0000000000
1	0.0174532925	61	1.0174532925	121	2.0174532925	1	.0002908882	1	0.0000048481
2	0.0349065850	62	1.0349065850	122	2.0349065850	2	.0005817764	2	0.0000096963
3	0.0523598776	63	1.0523598776	123	2.0523598776	3	.0008726646	3	0.0000145444
4	0.0698131701	64	1.0698131701	124	2.0698131701	4	.0011635528	4	0.0000193925
5	0.0872664626	65	1.0872664626	125	2.0872664626	5	.0014544410	5	0.0000242407
6	0.1047197551	66	1.1047197551	126	2.1047197551	6	.0017453293	6	0.0000290888
7	0.1221730476	67	1.1221730476	127	2.1221730476	7	.0020362175	7	0.0000339370
8	0.1396263402	68	1.1396263402	128	2.1396263402	8	.0023271057	8	0.0000387851
9	0.1570796327	69	1.1570796327	129	2.1570796327	9	.0026179939	9	0.0000436332
10	0.1745329252	70	1.1745329252	130	2.1745329252	10	.0029088821	10	0.0000484814
11	0.1919862177	71	1.1919862177	131	2.1919862177	11	.0031997703	11	0.0000533295
12	0.2094395102	72	1.2094395102	132	2.2094395102	12	.0034906585	12	0.0000581776
13	0.2268928028	73	1.2268928028	133	2.2268928028	13	.0037815467	13	0.0000630258
14	0.2443460953	74	1.2443460953	134	2.2443460953	14	.0040724349	14	0.0000678739
15	0.2617993878	75	1.2617993878	135	2.2617993878	15	.0043633231	15	0.0000727221
16	0.2792526803	76	1.2792526803	136	2.2792526803	16	.0046542113	16	0.0000775702
17	0.2967059728	77	1.2967059728	137	2.2967059728	17	.0049450995	17	0.0000824183
18	0.3141592654	78	1.3141592654	138	2.3141592654	18	.0052359878	18	0.0000872665
19	0.3316125579	79	1.3316125579	139	2.3316125579	19	.0055268760	19	0.0000921146
20	0.3490658504	80	1.3490658504	140	2.3490658504	20	.0058177642	20	0.0000969627
21	0.3665191429	81	1.3665191429	141	2.3665191429	21	.0061086524	21	0.0001018109
22	0.3839724354	82	1.3839724354	142	2.3839724354	22	.0063995406	22	0.0001066590
23	0.4014257280	83	1.4014257280	143	2.4014257280	23	.0066904288	23	0.0001115071
24	0.4188790205	84	1.4188790205	144	2.4188790205	24	.0069813170	24	0.0001163553
25	0.4363323130	85	1.4363323130	145	2.4363323130	25	.0072722052	25	0.0001212034
26	0.4537856055	86	1.4537856055	146	2.4537856055	26	.0075630934	26	0.0001260516
27	0.4712388980	87	1.4712388980	147	2.4712388980	27	.0078539816	27	0.0001308997
28	0.4886921906	88	1.4886921906	148	2.4886921906	28	.0081448698	28	0.0001357478
29	0.5061454831	89	1.5061454831	149	2.5061454831	29	.0084357581	29	0.0001405960
30	0.5235987756	90	1.5235987756	150	2.5235987756	30	.0087266463	30	0.0001454441
31	0.5410520681	91	1.5410520681	151	2.5410520681	31	.0090175345	31	0.0001502922
32	0.5585053606	92	1.5585053606	152	2.5585053606	32	.0093084227	32	0.0001551404
33	0.5759586532	93	1.5759586532	153	2.5759586532	33	.0095993109	33	0.0001599885
34	0.5934119457	94	1.5934119457	154	2.5934119457	34	.0098901991	34	0.0001648367
35	0.6108652382	95	1.6108652382	155	2.6108652382	35	.0101810873	35	0.0001696848
36	0.6283185307	96	1.6283185307	156	2.6283185307	36	.0104719755	36	0.0001745329
37	0.6457718232	97	1.6457718232	157	2.6457718232	37	.0107628637	37	0.0001793811
38	0.6632251158	98	1.6632251158	158	2.6632251158	38	.0110537519	38	0.0001842292
39	0.6806784083	99	1.6806784083	159	2.6806784083	39	.0113446401	39	0.0001890773
40	0.6981317008	100	1.6981317008	160	2.6981317008	40	.0116355283	40	0.0001939255
41	0.7155849933	101	1.7155849933	161	2.7155849933	41	.0119264166	41	0.0001987736
42	0.7330382858	102	1.7330382858	162	2.7330382858	42	.0122173048	42	0.0002036217
43	0.7504915784	103	1.7504915784	163	2.7504915784	43	.0125081930	43	0.0002084699
44	0.7679448709	104	1.7679448709	164	2.7679448709	44	.0127990812	44	0.0002133180
45	0.7853981634	105	1.7853981634	165	2.7853981634	45	.0130899694	45	0.0002181662
46	0.8028514559	106	1.8028514559	166	2.8028514559	46	.0133808576	46	0.0002230143
47	0.8203047484	107	1.8203047484	167	2.8203047484	47	.0136717458	47	0.0002278624
48	0.8377580410	108	1.8377580410	168	2.8377580410	48	.0139626340	48	0.0002327106
49	0.8552113335	109	1.8552113335	169	2.8552113335	49	.0142535222	49	0.0002375587
50	0.8726646260	110	1.8726646260	170	2.8726646260	50	.0145444104	50	0.0002424068
51	0.8901179185	111	1.8901179185	171	2.8901179185	51	.0148352986	51	0.0002472550
52	0.9075712110	112	1.9075712110	172	2.9075712110	52	.0151261869	52	0.0002521031
53	0.9250245036	113	1.9250245036	173	2.9250245036	53	.0154170751	53	0.0002569513
54	0.9424777961	114	1.9424777961	174	2.9424777961	54	.0157079633	54	0.0002617994
55	0.9599310886	115	1.9599310886	175	2.9599310886	55	.0159988515	55	0.0002666475
56	0.9773843811	116	1.9773843811	176	2.9773843811	56	.0162897397	56	0.0002714957
57	0.9948376736	117	1.9948376736	177	2.9948376736	57	.0165806279	57	0.0002763438
58	1.0122909662	118	2.0122909662	178	3.0122909662	58	.0168715161	58	0.0002811919
59	1.0297442587	119	2.0297442587	179	3.0297442587	59	.0171624043	59	0.0002860401
60	1.0471975512	120	2.0471975512	180	3.0471975512	60	.0174532926	60	0.0002908882

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 76°

			0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
4°	78	384	1153	1922	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
[illegible]	80	[illegible]	[illegible]	[illegible]	1346	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4038	[illegible]	[illegible]	5192	5576	[illegible]
[illegible]	82	[illegible]	[illegible]	641	[illegible]	[illegible]	1410	[illegible]	[illegible]	[illegible]	2436	2692	[illegible]	[illegible]	3461	3717	3974
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1296	[illegible]	1490
[illegible]	94	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	641	726	[illegible]	[illegible]	[illegible]	[illegible]	1153	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	192	[illegible]	[illegible]	[illegible]	[illegible]	676	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1038	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	944	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	544	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	112	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	445	481	534	576	613	652
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	344	384	[illegible]	482	[illegible]	548	[illegible]	[illegible]
16°	116	[illegible]	[illegible]	96	134	173	211	[illegible]	[illegible]	[illegible]	365	403	442	480	519	557	596
34°	118	[illegible]	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
32°	120	[illegible]	52	[illegible]	122	157	192	227	[illegible]	297	332	367	402	437	472	506	541
[illegible]	122	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	384	418	451	484	[illegible]
28°	124	[illegible]	49	[illegible]	112	144	176	[illegible]	[illegible]	[illegible]	304	[illegible]	[illegible]	400	[illegible]	464	[illegible]
[illegible]	126	[illegible]	46	[illegible]	107	138	169	200	[illegible]	[illegible]	292	323	353	384	415	446	[illegible]
74°	128	[illegible]	[illegible]	[illegible]	103	[illegible]	162	[illegible]	[illegible]	[illegible]	[illegible]	310	340	369	399	428	458

227
Sue 20

S-34

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 76°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
4°	33	264	1098	1932	2632	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
6°	30	60	362	1740	1733	2115	2884	2884	3269	3653	4038	4423	4807	5192	5576	5961	
			4			42			1923	2307	2692	4					
62°	24	48	288	480	673	864	1056	1248	1442	1634	1826	2019	211	403	2595	2787	
					192	96	288		480	672	864		1248	1440	1632	1824	
60°	18	36	216	432	648	846	705	933	1152	1369	1586	1803	1346	1602	1730	1858	1987
58°	16	32	192	384	576	768	960	1152	1344	1536	1728	1920	1373	1483	1693	1703	
56°	32	48	44	240	336	432	528	624	721	817	913	1009	1105	1201	1298	1394	1490
54°	24	48	120	312	384	384	470	556	641	726	811	897	982	1068	1153	1239	1324
52°	26	52	104	208	312	416	520	624	728	832	936	1040	1144	1248	1352	1456	1560
50°	28	56	112	224	336	448	560	672	784	896	1008	1120	1232	1344	1456	1568	1680
48°	24	48	96	192	288	384	480	576	672	768	864	960	1056	1152	1248	1344	1440
46°	22	44	88	176	264	352	440	528	616	704	792	880	968	1056	1144	1232	1320
44°	20	40	80	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200
42°	18	36	72	144	216	288	360	432	504	576	648	720	792	864	936	1008	1080
40°	16	32	64	128	192	256	320	384	448	512	576	640	704	768	832	896	960
38°	14	28	56	112	168	224	280	336	392	448	504	560	616	672	728	784	840
36°	12	24	48	96	144	192	240	288	336	384	432	480	528	576	624	672	720
34°	10	20	40	80	120	160	200	240	280	320	360	400	440	480	520	560	600
32°	8	16	32	64	96	128	160	192	224	256	288	320	352	384	416	448	480
30°	6	12	24	48	72	96	120	144	168	192	216	240	264	288	312	336	360
28°	4	8	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
26°	2	4	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120

Sue 20

HOLMES & NARVER INC., ENGINEERS

JOB No.____

LIST OF DIRECTIONS

STATION _____ DATE _____

CHIEF OF PART _____ COMPUTED BY _____

OBSERVER _____ CHECKED BY _____

OBSERVED STATION	OBSERVED DIRECTION	SEC RED	SEA LEVEL RED	CORRECTED DIR. ZERO INITIAL	ADJ. DIR.
	0° 00' 00.00"			0° 00' 00.00"	

Sur 21

HOLMES & NARVER INC., ENGINEERS

JOB NO. ____

LIST OF DIRECTIONS

STATION _____ DATE _____

CHIEF OF PARTY _____ COMPUTED BY _____

OBSERVER _____ CHECKED BY _____

OBSERVED STATION	OBSERVED DIRECTION	ECC. RED.	SEA LEVEL RED.	CORRECTED DIR. ZERO INITIAL	ADJ. DIR.
	0° 00' 00.00"			0° 00' 00.00"	

230 SUR

JOB NO. ____

HOLMES & NARVER INC. ENGINEERS

ABSTRACT OF DIRECTIONS

STATION _____ COMPUTED BY _____ DATE _____

OBSERVER _____ CHECKED BY _____ INST. _____

POSITION		STATIONS OBSERVED				
	INITIAL 0° 00'					
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
SUM						
MEAN						
CORR. FOR ECC.						
DIRECTION						

JOB NO.___

HOLMES & NARVER INC., ENGINEERS

ABSTRACT OF DIRECTIONS

STATION_____ COMPUTED BY_____ DATE_____

OBSERVER_____ CHECKED BY_____ INST._____

POSITION	STATIONS OBSERVED					
	INITIAL 0° 00′					
1	0.00"					
2	0.00"					
3	0.00"					
4	0.00"					
5	0.00"					
6	0.00					
7	0.00"					
8	0.00					
9	0.00"					
10	0.00"					
11	0.00"					
12	0.00"					
13	0.00"					
14	0.00"					
15	0.00"					
16	0.00"					
SUM						
MEAN						
CORR. FOR ECC.						
DIRECTION						

TEMPERATURE RRECTION TABLE

Coefficient of Expansion - 0.000006
Standard Temperature - 20°C
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperatures above 20°

	LENGTH IN METERS													
TEMP	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50
21								1	1	1	1	1	2	2	2
22							1	1	2	2	2	3	3	4	4
23						1	1	2	2	3	4	4	5	5	6
24					1	1	2	2	3	4	5	6	6	7	8
25					1	2	2	3	4	5	6	7	8	9	10
26					1	2	3	4	5	6	7	8	10	11	12
[illegible]															

CONVERSION TABLE

FEET	to	METERS
1		.304800
2		.609601
3		.914401
4		1.219202
5		1.524002
6		1.828803
7		2.133604
8		2.438404
9		2.743205
10		3.048006
20		6.096012
[illegible]		

TEMPERATURE CORRECTION TABLE

Coefficient of Expansion - 0.000006
Standard Temperature - 20° C
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperatures above 20°

	LENGTH IN METERS													
TEMP. C°	1	2	3	4	5	10	15	20	25	30	35	40	45	50
21							1	1	1	1	1	2	2	2
22						1	1	2	2	2	3	3	4	4
23					1	1	2	2	3	4	4	5	5	6
24				1	1	2	2	3	4	5	6	6	7	8
25			1	1	1	2	3	4	5	6	7	8	9	10
26			1	1	1	2	4	5	6	7	8	10	11	12
27			1	1	1	3	4	6	7	8	10	11	13	14
28			1	1	2	3	5	6	8	10	11	13	14	16
29			1	1	2	4	5	7	9	11	13	14	16	18
30			1	2	2	4	6	8	10	12	14	16	18	20
31			1	2	3	4	7	9	11	13	16	18	20	22
32			1	2	3	5	7	10	12	14	17	19	22	24
33		1	1	2	3	5	8	10	13	16	18	21	23	26
34		1	1	2	3	6	8	11	14	17	20	22	25	28
35		1	2	2	4	6	9	12	15	18	21	24	27	30
36		1	2	3	4	6	10	13	16	19	23	26	29	32
37		1	2	3	4	7	10	14	17	20	24	27	31	34
38		1	2	3	4	7	11	14	18	22	26	29	32	36
39		1	2	3	5	8	11	15	19	23	27	30	34	38
40		1	2	3	5	8	12	16	20	24	28	32	36	40
41		1	2	3	5	8	13	17	21	25	29	34	38	42
42		1	2	3	4	9	13	18	22	26	31	35	40	44
43		1	2	3	4	9	14	18	23	28	32	37	41	46
44		1	2	3	4	5	10	14	19	24	29	34	38	43	48
45		1	2	3	4	5	10	15	20	25	30	35	40	45	50

CONVERSION TABLE		
FEET	to	METERS
1		.3048006
2		.6096012
3		.9144018
4		1.2192024
5		1.5240030
6		1.8288037
7		2.1336043
8		2.4384049
9		2.7432055
10		3.0480061
20		6.0960122
30		9.1440183
40		12.1920244
50		15.2400305
60		18.2880365
70		21.3360426
80		24.3840487
90		27.4320548
100		30.4800609

3/3

TEMPERATURE CORRECTION TABLE

Coefficient of Expansion - 0.0000004
Standard Temperature - 20° C.
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperature above 20°

	LENGTH IN METERS													
TEMP C°	1	2	3	4	5	10	15	20	25	30	35	40	45	50
21							1	1	1	1	1	2	2	2
22						1	1	2	2	2	3	3	4	4
[illegible]					1	1	2	2	3	4	4	5	5	6
[illegible]				1	1	2	2	3	4	5	6	6	7	8
[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	9	10
[illegible]				1	1	2	4	5	6	7	8	10	11	12
[illegible]				[illegible]	[illegible]	[illegible]	4	6	7	8	10	11	13	14
28			1	1	2	3	5	6	8	10	11	13	14	16
29		1	1	1	2	4	5	7	9	11	13	14	16	18
30		1	1	2	2	4	6	8	10	12	14	16	18	20
31		1	1	2	2	4	7	9	11	13	16	18	20	22
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	5	7	10	12	14	17	19	22	24
33		1	2	2	3	6	8	10	13	16	18	21	23	26
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	11	14	17	20	22	25	28
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9	12	15	18	21	24	27	30
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	13	16	19	23	26	29	32
[illegible]		[illegible]	[illegible]	1	1	3	10	14	17	20	24	27	31	34
[illegible]		[illegible]	1	2	2	4	11	14	18	22	26	29	32	36
[illegible]	1	1	2	2	3	4	11	15	19	23	27	30	34	38
40	1	2	2	3	4	8	12	16	20	24	28	32	36	40
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	13	17	21	25	29	34	38	42
42	1	2	3	4	4	9	13	18	22	26	31	35	40	44
43	1	2	3	4	5	9	14	18	23	28	32	37	41	46
44	1	2	3	4	5	10	14	19	24	29	34	38	43	48
45	1	2	3	4	5	10	15	20	25	30	35	40	45	50

CONVERSION TABLE

FEET to METERS	
1	.3048006
2	.6096012
3	.9144018
4	1.2192024
5	1.5240030
6	1.8288037
7	2.1336043
8	2.4384049
9	2.7432055
10	3.0480061
20	6.0960122
30	9.1440183
40	12.1920244
50	15.2400305
60	18.2880365
70	21.3360426
80	24.3840487
90	27.4320548
100	30.4800609

JOB NO

SITE:

PARTY:

WEEKLY WORK REPORT

WEEK ENDING _____

	SITE	DESCRIPTION OF WORK	REMARKS
MONDAY			
TUESDAY			
WEDNESDAY			
THURSDAY			
FRIDAY			
SATURDAY			
SUNDAY			

JOB NO. _____ HOLMES & NARVER PARTY: _____

SITE: _____ SURVEY DEPARTMENT

WEEKLY WORK REPORT

WEEK ENDING _____

	SITE	DESCRIPTION OF WORK	REMARKS
MONDAY			
TUESDAY			
WEDNESDAY			
THURSDAY			
FRIDAY			
SATURDAY			
SUNDAY			

237

JOB Nº ____

HOLMES & NARVER INC., ENGINEERS

INVERSE POSITION COMPUTATION

NAME OF STATION

1. ϕ		λ	° ' "
2. ϕ'		λ'	
$\Delta\phi\ (=\phi'-\phi)$		$\Delta\lambda\ (=\lambda'-\lambda)$	
$\frac{\Delta\phi}{2}$		$\frac{\Delta\lambda}{2}$	
$\phi_m\ (=\phi+\frac{\Delta\phi}{2})$			
$\Delta\phi$ (secs)			
$\log \Delta\phi$		$\log \Delta\lambda$	
cor. arc − sin			
$\log \Delta\phi_1$			
$\log \cos \frac{\Delta\lambda}{2}$		$\log \cos \phi_m$	
colog B_m		colog A_m	
$\log\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$		$\log\{s_1 \sin(\alpha+\frac{\Delta\alpha}{2})\}$	
		$\log\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$	
$\log \Delta\lambda$		$\tan(\alpha+\frac{\Delta\alpha}{2})$	
$\log \sin \phi_m$		$\frac{\Delta\lambda}{2}$	
$\log \sec \frac{\Delta\phi}{2}$		$\sin(\alpha+\frac{\Delta\alpha}{2})$	
$\log a$		$\cos(\alpha+\frac{\Delta\alpha}{2})$	
a		s_1	
b			
$-\Delta\alpha$ (secs)			
$-\frac{\Delta\alpha}{2}$			
$\alpha+\frac{\Delta\alpha}{2}$			
α (1 to 2)			
$\Delta\alpha$			
α' (2 to 1)			

JOB Nº____

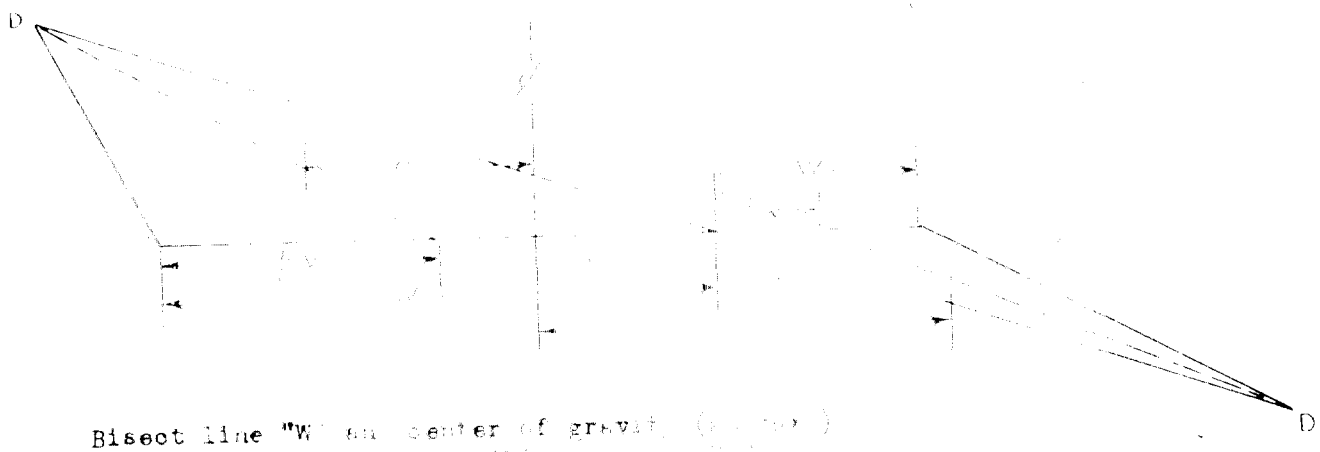
HOLMES & NARVER INC. ENGINEERS

INVERSE POSITION COMPUTATION

NAME OF STATION

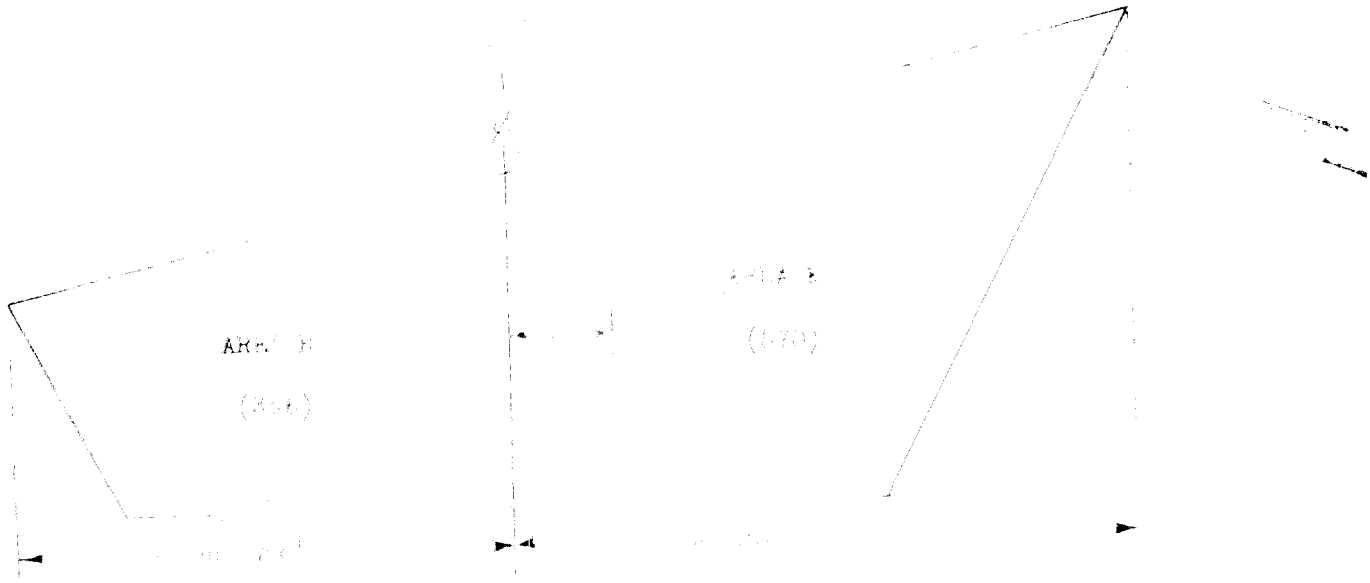
1 ϕ			λ	°	′	″
2 ϕ'			λ'			
$\Delta\phi\ (=\phi'-\phi)$			$\Delta\lambda\ (=\lambda'-\lambda)$			
$\frac{\Delta\phi}{2}$			$\frac{\Delta\lambda}{2}$			
$\phi_m\ (=\phi+\frac{\Delta\phi}{2})$						
$\Delta\phi$ (secs)			$\Delta\lambda$ (secs)			
log $\Delta\phi$			log $\Delta\lambda$			
cor. arc − sin			cor. arc − sin			
log $\Delta\phi_1$			log $\Delta\lambda_1$			
log cos $\frac{\Delta\lambda}{2}$			log cos ϕ_m			
colog B_m			colog A_m			
log $\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$		(opposite in sign to $\Delta\phi$)	log $\{s_1 \sin(\alpha+\frac{\Delta\alpha}{2})\}$			
			log $\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$			
log $\Delta\lambda$		3 log $\Delta\lambda$	log tan $(\alpha+\frac{\Delta\alpha}{2})$			
log sin ϕ_m		log k	$\alpha+\frac{1}{2}\Delta\alpha$			
log sec $\frac{\Delta\phi}{2}$		log h	log sin $(\alpha+\frac{\Delta\alpha}{2})$			
log a			log cos $(\alpha+\frac{\Delta\alpha}{2})$			
a			log s_1			
b						
$-\Delta\alpha$ (secs)						
$-\frac{\Delta\alpha}{2}$						
$\alpha+\frac{\Delta\alpha}{2}$						
α (1 to 2)						
$\Delta\alpha$						
α' (2 to 1)						

239
SUE 25



Bisect line "W" on center of gravity ( )
is 1/3 the distance from this point

Eccentricity of the section is the distance
the center of gravity to centerline.



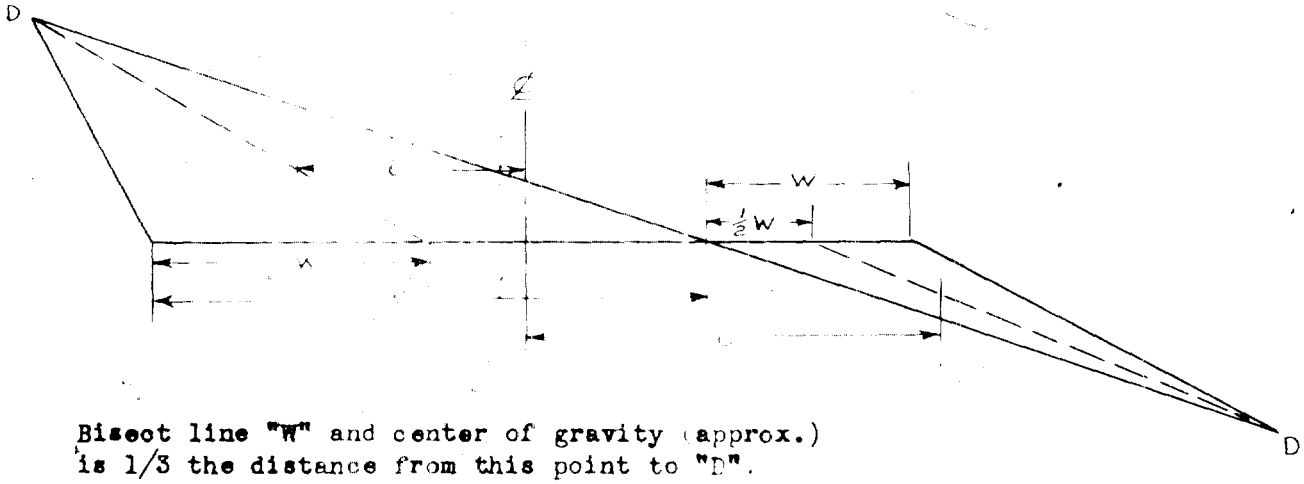
$$e = \frac{I_x \cdot S}{3I}$$ ( )

$$= \frac{S}{3448} \times 324$$

Determine area of sections each side of the centerline.
Solve the statical moment centerline (a leg of one or each
side and apply the formula.

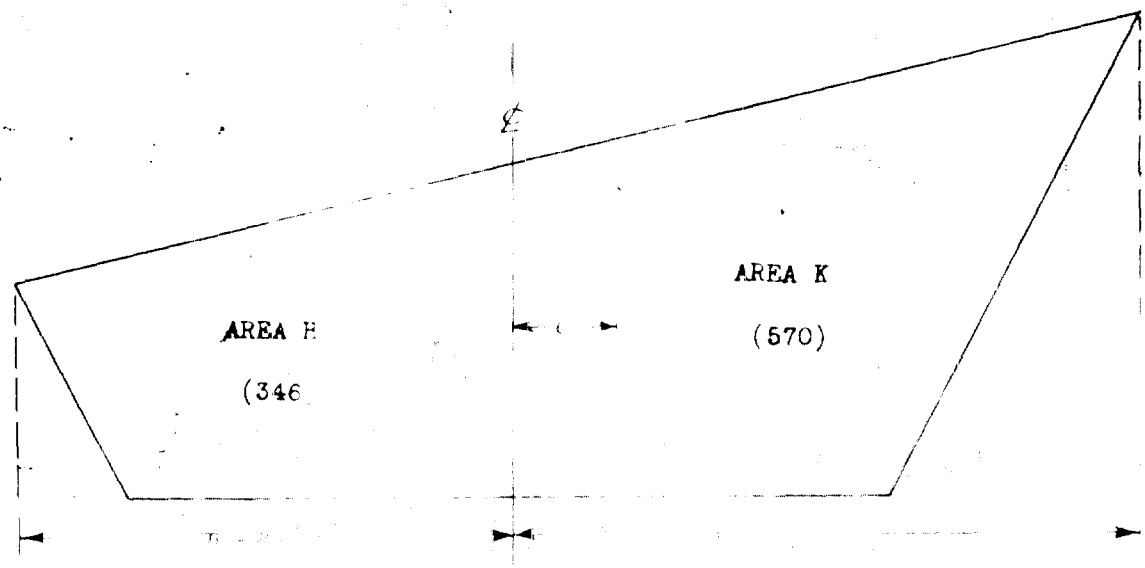
COMPENSATION FOR CURVATURE - [illegible] VARIAGE CALCULATIONS

ECCENTRICITY OF CENTER OF GRAVITY OF SECTION



Bisect line "W" and center of gravity (approx.) is 1/3 the distance from this point to "D".

Eccentricity of the section is the distance from the center of gravity to centerline.



$$e = \frac{n + m}{3A} (K - H)$$

H = 346
K = 62[illegible]
Sum [illegible] Diff. = 224

$$e = \frac{69}{2448} \times 2.4[illegible]$$

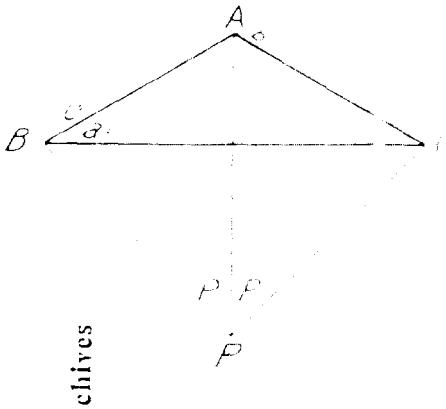
Determine area of sections each side of the centerline. Scale the distance from center line to [illegible] of cut on each side and apply the formula.

241

SUR 26

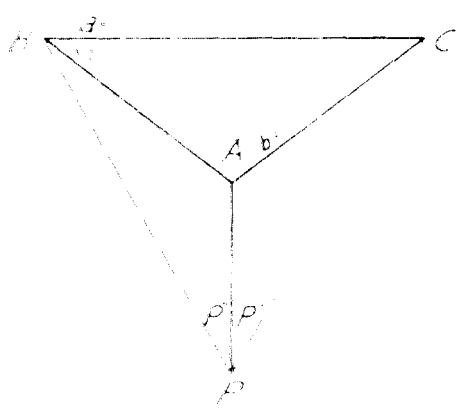
COMPUTATION OF FIRST ORDER TRIANGLE

CASE 1



CASE 2

CASE 3



CASE 1 & 2

P

P''

A

SUM

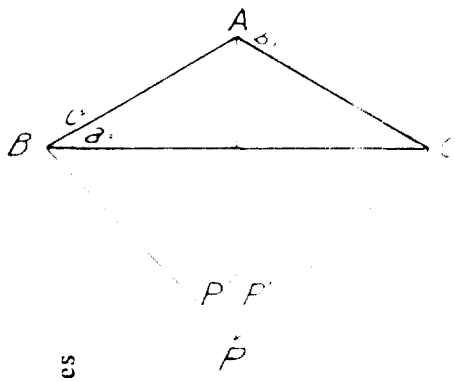
SUM

S - 180° - ½ SUM

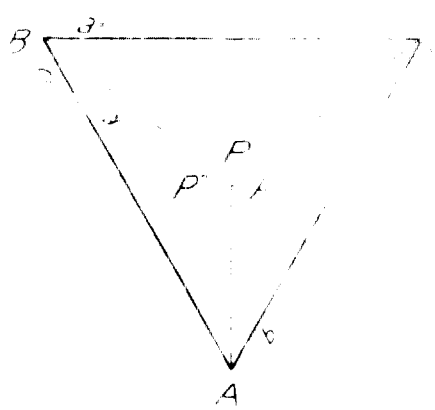
CASE 3

COMPUTATION OF [illegible] PROBLEM

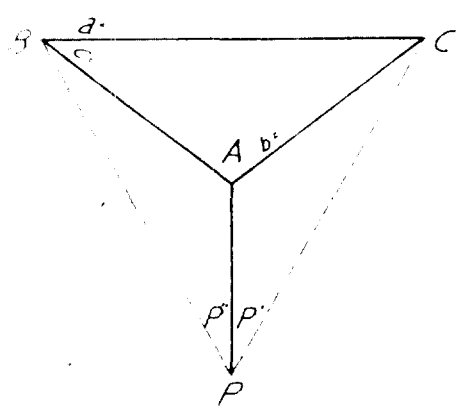
CASE 1



CASE 2



CASE 3



CASE 1 & 2	CASE 3
P'	
P''	
A	SUM
SUM	A
½ SUM	A - SUM
S = 180° - ½ SUM =	S = ½ (A - SUM) =

LOG C

LOG SIN P'

COLOG b

COLOG SIN P''

SUM = LOG TAN Z =

Z = A'

LOG COS (Z + 45°)

LOG TAN S

SUM = LOG TAN (Z + 45°)

S

(CASE 1)	(CASE 2)
S + C = ANGLE BAP	S + C = ANGLE APB
S - C = ANGLE ACP	S - C = ANGLE ACP

SURVEY EQUIPMENT
PARTY CHIEF'S INVENTORY
PROPERTY TITLE

DATE

ITEM	MFR & SERIAL NO	H.H.S. NO	AEC NO	CONDITION
TRANSIT				
LEVEL				
THEODOLITE				
SEXTANT				
BINOCULARS				
ALIDADE				
PLANE TABLE W/ TRIPOD				
TRIPOD, STEP-LEG				
TRIPOD, ADJUSTABLE				

	MAKE	TYPE	AEC NO.
VEHICLE			

THE ABOVE EQUIPMENT IS IN MY CUSTODY.

SIGNED

TITLE

244

SURVEY DEPARTMENT
PARTY CHIEF'S INVENTORY
PROPERTY ITEM

DATE

ITEM	MFR & SERIAL NO	HBN NO	AEC NO	CONDITION
TRANSIT				
LEVEL				
THEODOLITE				
SEXTANT				
BINOCULARS				
ALIDADE				
PLANE TABLE W/ TRIPOD				
TRIPOD, STIFF-LEG				
TRIPOD, ADJUSTABLE				
	MAKE	TYPE	AEC NO	
VEHICLE				

THE ABOVE EQUIPMENT IS IN MY CUSTODY.

ATOLL
245

SURVEY DEPARTMENT
PARTY CHIEF'S INVENTORY
NON-PROPERTY ITEMS

DATE _____

ITEM	QUAN	CONDITION	ITEM	QUAN	CONDITION
TAPE, STEEL, 100'			WATER JUGS, 5 GAL		
TAPE, STEEL, 300'			COFFEE JUGS, 1 GAL		
TAPE, CLOTH			HATCHETS		
HAND LEVELS					
LEVEL RODS					
LEVEL ROD LEVELS					
THERMOMETERS					
READING GLASSES					
TENSION HANDLES					
TAPE CLAMPS					
BOOK BAGS					
PLUMB BOBS					
PLUMB BOB SHEATHS					
AXES					
BRUSH HOOKS					
SLEDGES					
STAKE BAGS					
SHOVELS					
STEEL DIES, NUMBERS					
STEEL DIES, LETTERS					
HAMMERS					
PLIERS					

THE ABOVE EQUIPMENT IS IN MY CUSTODY

SIGNED

TITLE

ATOLL

246

SURVEY DEPARTMENT
PARTY CHIEFS INVENTORY
NON PROPERTY ITEMS

DATE _____

ITEM	QUAN	CONDITION	ITEM	QUAN	CONDITION
TAPE, STEEL, 100'			WATER JUGS, 5 GAL.		
TAPE, STEEL, 300			COFFEE JUGS, 1 GAL.		
TAPE, CLOTH			HATCHETS		
HAND LEVELS					
LEVEL RODS					
LEVEL ROD LEVELS					
THERMOMETERS					
READING GLASSES					
TENSION HANDLES					
TAPE CLAMPS					
BOOK BAGS					
PLUMB BOBS					
PLUMB BOB SHEATHS					
AXES					
BRUSH HOOKS					
SLEDGES					
STAKE BAGS					
SHOVELS					
STEEL DIES, NUMBERS					
STEEL DIES, LETTERS					
HAMMERS					
PLIERS					

THE ABOVE EQUIPMENT IS IN MY CUSTODY.

SIGNED _____

ATOLL

247

VOLUME IN [illegible]

Acres										
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	129.1	145.2
1	161.3	177.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	290.4	306.5
2	322.7	338.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	419.5	435.6	451.7	467.9
3	484.0	500.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	580.5	596.6	613.1	629.2
4	645.3	661.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	742.1	758.2	774.4	790.5
5	806.7	822.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	903.8	919.9	935.7	951.9
6	968.0	984.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1065	1081	1097	1113
7	1129	1145	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1226	1242	1258	1275
8	1291	1307	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1387	1404	1420	1436
9	1452	1468	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1549	1565	[illegible]	1597
10	1613	1629	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1710	1726	1742	1759
11	1775	1791	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1871	1887	[illegible]	1920
12	1936	1952	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2065	2081
13	2097	2113	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2226	2243
14	2259	2275	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2404
15	2420	2436	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2565
16	2581	2597	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2727
17	2743	2759	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2872	2888
18	2904	2920	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3049
19	3065	3081	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3211
20	3227	3243	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3372
21	3388	3404	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3533
22	3549	3565	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3695
23	3711	3727	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3856
24	3872	3888	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4017
25	4033	4049	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4178
26	4195	4211	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4340
27	4356	4372	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4501
28	4517	4533	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4663
29	4679	4695	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4824
30	4840	4856	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4985
31	5001	5017	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5147
32	5163	5179	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5308
33	5324	5340	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5469
34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5631
35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5792
36	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
49	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] 615 333 cu-yds. per 40 ft. = 161.723 per 0.1 ft.

Coefficient of Expansion - 0.0000004
Standard Temperature - 20° C.
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperature above 20°

TEMP C	LENGTH IN METERS													
	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50
0								1	1	1	1	1	2	2	2
1							1	1	1	2	2	2	2	3	3
2															
3															
4															
5															
6															
7															
8															
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44															
45															
46															
47															
48															
49															
50															

CONVERSION TABLE

Meters	Feet
1	3.280833
2	6.561667
3	9.842500
4	13.123333
5	16.404167
6	19.685000
7	22.965833
8	26.246667
9	29.527500
10	32.808333
20	65.616667
30	98.425000
40	131.233333
50	164.041667
60	196.850000
70	229.658333
80	262.466667
90	295.275000
100	328.083333

Degrees						Minutes		Seconds	
0°	0.0000000000	60°	1.[illegible]5812	120°	2.[illegible]1024	0'	0.0000000000	0"	0.0000000000
1	0.0174532925	61	1.[illegible]8437	121	2.[illegible]6949	1	0.0002908882	1	0.0000048481
2	0.0349065850	62	1.[illegible]1362	122	2.[illegible]6874	2	0.0005817764	2	0.0000096963
3	0.0523598776	63	1.[illegible]4288	123	2.[illegible]9800	3	0.0008726646	3	0.0000145444
4	0.0698131701	64	1.[illegible]7213	124	2.[illegible]2726	4	0.0011635528	4	0.0000193925
5	0.0872664626	65	1.[illegible]0138	125	2.[illegible]5650	5	0.0014544410	5	0.0000242407
6	0.1047197551	66	1.[illegible]3063	126	2.[illegible]8575	6	0.0017453293	6	0.0000290888
7	0.1221730476	67	1.[illegible]5988	127	2.[illegible]1500	7	0.0020362175	7	0.0000339370
8	0.1396263402	68	1.[illegible]8914	128	2.[illegible]4426	8	0.0023271057	8	0.0000387851
9	0.1570796327	69	1.[illegible]1839	129	2.[illegible]7351	9	0.0026179939	9	0.0000436332
10	0.1745329252	70	1.[illegible]4764	130	2.[illegible]0276	10	0.0029088821	10	0.0000484814
11	0.1919862177	71	1.[illegible]7689	131	2.[illegible]3201	11	0.0031997703	11	0.0000533295
12	0.2094395102	72	1.[illegible]0614	132	2.[illegible]6126	12	0.0034906585	12	0.0000581776
13	0.2268928028	73	1.[illegible]3540	133	2.[illegible]9052	13	0.0037815467	13	0.0000630258
14	0.2443460953	74	1.[illegible]6465	134	2.[illegible]1977	14	0.0040724349	14	0.0000678739
15	0.2617993878	75	1.[illegible]9390	135	2.[illegible]4902	15	0.0043633231	15	0.0000727221
16	0.2792526803	76	1.[illegible]2315	136	2.[illegible]7827	16	0.0046542113	16	0.0000775702
17	0.2967059728	77	1.3439035240	137	2.[illegible]0752	17	0.0049450995	17	0.0000824183
18	0.3141592654	78	1.3613568166	138	2.4058643678	18	0.0052359878	18	0.0000872665
19	0.3316125579	79	1.3788101091	139	2.4260076603	19	0.0055268760	19	0.0000921146
20	0.3490658504	80	1.3962634016	140	2.4434609528	20	0.0058177642	20	0.0000969627
21	0.3665191429	81	1.4137166941	141	2.4609142453	21	0.0061086524	21	0.0001018109
22	0.3839724354	82	1.4311699866	142	2.4783675378	22	0.0063995406	22	0.0001066590
23	0.4014257280	83	1.4486232792	143	2.4958208304	23	0.0066904288	23	0.0001115071
24	0.4188790205	84	1.4660765717	144	2.5132741229	24	0.0069813170	24	0.0001163553
25	0.4363323130	85	1.4835298642	145	2.5307274154	25	0.0072722052	25	0.0001212034
26	0.4537856055	86	1.5009831567	146	2.5481807079	26	0.0075630934	26	0.0001260516
27	0.4712388980	87	1.5184364492	147	2.5656340004	27	0.0078539816	27	0.0001308997
28	0.4886921906	88	1.5358897418	148	2.5830872930	28	0.0081448698	28	0.0001357478
29	0.5061454831	89	1.5533430343	149	2.6005405855	29	0.0084357581	29	0.0001405960
30	0.5235987756	90	1.5707963268	150	2.6179938780	30	0.0087266463	30	0.0001454441
31	0.5410520681	91	1.5882496193	151	2.6354471705	31	0.0090175345	31	0.0001502922
32	0.5585053606	92	1.6057029118	152	2.6529004630	32	0.0093084227	32	0.0001551404
33	0.5759586532	93	1.6231562044	153	2.6703537556	33	0.0095993109	33	0.0001599885
34	0.5934119457	94	1.6406094969	154	2.6878070481	34	0.0098901991	34	0.0001648367
35	0.6108652382	95	1.6580627894	155	2.7052603406	35	0.0101810873	35	0.0001696848
36	0.6283185307	96	1.6755160819	156	2.7227136331	36	0.0104719755	36	0.0001745329
37	0.6457718232	97	1.6929693744	157	2.7401669256	37	0.0107628637	37	0.0001793811
38	0.6632251158	98	1.7104226670	158	2.7576202182	38	0.0110537519	38	0.0001842292
39	0.6806784083	99	1.7278759595	159	2.7750735107	39	0.0113446401	39	0.0001890773
40	0.6981317008	100	1.7453292520	160	2.7925268032	40	0.0116355283	40	0.0001939255
41	0.7155849933	101	1.7627825445	161	2.8099800957	41	0.0119264166	41	0.0001987736
42	0.7330382858	102	1.7802358370	162	2.8274333882	42	0.0122173048	42	0.0002036217
43	0.7504915784	103	1.7976891296	163	2.8448866808	43	0.0125081930	43	0.0002084699
44	0.7679448709	104	1.8151424221	164	2.8623399733	44	0.0127990812	44	0.0002133180
45	0.7853981634	105	1.8325957146	165	2.8797932658	45	0.0130899694	45	0.0002181662
46	0.8028514559	106	1.8500490071	166	2.8972465583	46	0.0133808576	46	0.0002230143
47	0.8203047484	107	1.8675022996	167	2.9146998508	47	0.0136717458	47	0.0002278624
48	0.8377580410	108	1.8849555922	168	2.9321531434	48	0.0139626340	48	0.0002327106
49	0.8552113335	109	1.9024088847	169	2.9496064359	49	0.0142535222	49	0.0002375587
50	0.8726646260	110	1.9198621772	170	2.9670597284	50	0.0145444104	50	0.0002424068
51	0.8901179185	111	1.9373154697	171	2.9845130209	51	0.0148352986	51	0.0002472550
52	0.9075712110	112	1.9547687622	172	3.0019663134	52	0.0151261869	52	0.0002521031
53	0.9250245036	113	1.9722220548	173	3.0194196060	53	0.0154170751	53	0.0002569513
54	0.9424777961	114	1.9896753473	174	3.0368728985	54	0.0157079633	54	0.0002617994
55	0.9599310886	115	2.0071286398	175	3.0543261910	55	0.0159988515	55	0.0002666475
56	0.9773843811	116	2.0245819323	176	3.0717794835	56	0.0162897397	56	0.0002714957
57	0.9948376736	117	2.0420352248	177	3.0892327760	57	0.0165806279	57	0.0002763438
58	1.0122909662	118	2.0594885174	178	3.1066860686	58	0.0168715161	58	0.0002811919
59	1.0297442587	119	2.0769418099	179	3.1241393611	59	0.0171624043	59	0.0002860401
60	1.0471975512	120	2.0943951024	180	3.1415926536	60	0.0174532926	60	0.0002908882

251

Sue 19

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 84°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
82° 56	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
57	38	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
58° 60	128	384	641	897	1153	1410	1666	1923	2179	2436	2692	2948	3205	3461	3717	3974
61	43	128	213	299	384	470	555	641	726	812	897	983	1068	1153	1239	1324
62° 64	85	171	256	342	427	513	598	684	769	855	940	1026	1111	1196	1282	1367
65	21	43	64	85	107	128	149	171	192	213	235	256	277	299	320	341
66° 68	43	85	128	171	213	256	299	342	384	427	470	513	555	598	641	684
69	64	128	192	256	320	384	448	513	577	641	705	769	833	897	961	1026
70° 72	85	171	256	342	427	513	598	684	769	855	940	1026	1111	1196	1282	1367
73	107	213	320	427	534	641	747	854	961	1068	1175	1281	1388	1495	1602	1709
74° 76	128	256	384	513	641	769	897	1026	1153	1282	1410	1538	1666	1794	1923	2051
77	149	299	448	598	747	897	1046	1196	1345	1495	1644	1794	1943	2093	2242	2392
78° 80	171	342	513	684	855	1026	1196	1367	1538	1709	1880	2051	2222	2393	2564	2735
81	192	384	577	769	961	1153	1345	1538	1730	1922	2115	2307	2499	2691	2884	3076
82° 84	213	427	641	854	1068	1281	1495	1709	1922	2136	2349	2563	2777	2990	3204	3418
85	235	470	705	940	1175	1410	1645	1880	2115	2350	2585	2820	3055	3290	3525	3760
86° 88	256	513	769	1026	1282	1538	1794	2051	2307	2564	2820	3076	3333	3589	3845	4102
89	277	555	833	1111	1388	1666	1943	2221	2499	2776	3054	3331	3609	3886	4164	4441
90° 92	299	598	897	1196	1495	1794	2093	2392	2691	2990	3289	3588	3887	4186	4485	4784
93	320	641	961	1281	1602	1922	2242	2563	2883	3204	3524	3844	4165	4485	4805	5126
94° 96	341	683	1024	1366	1707	2049	2390	2732	3073	3415	3756	4098	4439	4781	5122	5464
97	363	726	1088	1451	1813	2176	2538	2901	3263	3626	3988	4351	4713	5076	5438	5801
98° 100	384	769	1153	1538	1922	2307	2691	3076	3460	3845	4229	4614	4998	5383	5767	6152
101	405	811	1217	1622	2028	2433	2839	3244	3650	4055	4461	4866	5272	5677	6083	6488
102° 104	427	854	1281	1709	2136	2563	2990	3418	3845	4272	4699	5126	5553	5980	6407	6834
105	448	897	1345	1794	2242	2691	3139	3588	4036	4485	4933	5382	5830	6279	6727	7176
106° 108	470	940	1410	1880	2350	2820	3289	3759	4229	4699	5169	5639	6108	6578	7048	7518
109	491	982	1474	1965	2457	2948	3439	3931	4422	4913	5405	5896	6387	6879	7370	7861
110° 112	513	1026	1538	2051	2564	3076	3589	4102	4614	5127	5640	6153	6665	7178	7691	8204
113	534	1068	1602	2136	2670	3204	3738	4272	4806	5340	5874	6408	6942	7476	8010	8544
114° 116	555	1111	1666	2221	2777	3332	3887	4443	4998	5553	6108	6664	7219	7774	8329	8885
117	577	1153	1730	2307	2883	3460	4036	4613	5189	5766	6342	6919	7495	8072	8648	9225
118° 120	598	1196	1794	2392	2990	3588	4186	4784	5382	5980	6578	7176	7774	8372	8970	9568
121	619	1239	1858	2478	3097	3717	4336	4956	5575	6195	6814	7434	8053	8673	9292	9912
122° 124	641	1282	1922	2563	3204	3845	4485	5126	5767	6407	7048	7689	8329	8970	9611	10252
125	662	1324	1987	2649	3312	3974	4637	5299	5961	6624	7286	7949	8611	9273	9936	10598
126° 128	684	1367	2051	2735	3418	4102	4785	5469	6153	6836	7520	8204	8887	9571	10255	10938
129	705	1410	2115	2820	3525	4230	4935	5640	6345	7050	7755	8460	9165	9870	10575	11280
130° 132	726	1452	2178	2905	3631	4357	5083	5810	6536	7262	7988	8715	9441	10167	10894	11620
133	748	1495	2242	2990	3738	4485	5233	5980	6728	7475	8223	8970	9718	10465	11213	11960
134° 136	769	1538	2307	3076	3845	4614	5383	6153	6922	7691	8460	9229	9998	10767	11536	12305

CHORD AND DEFLECTION TABLE
FOR CURVES OF STANDARD RADII

CHORD = 2R X SIN (DEFL. FOR 1 ARC LENGTH)

DEFL. FOR 1' OF ARC = $\frac{1718.8733}{R}$

RADIUS	LENGTH OF ARC	DEFLECTION FOR ONE ARC LENGTH	CHORD	DEFLECTION FOR A ONE FOOT ARC
[illegible]	[illegible]	[illegible]	24.384	22.91831'
180	"	[illegible]	24.988	17.18873'
125	"	[illegible]	24.998	13.75009'
150	"	[illegible]	24.992	11.45916'
175	"	[illegible]	24.979	9.82213'
200	"	3°-34'-22"	24.964	8.59437'
225	"	[illegible]	[illegible]	7.63944'
250	"	[illegible]	[illegible]	6.87549'
275	"	[illegible]	[illegible]	6.25045'
300	"	2°-27'-33"	24.993	5.72958'
325	0	[illegible]	[illegible]	5.28884'
350	"	[illegible]	49.988	4.91107'
375	"	[illegible]	49.988	4.58366'
400	"	3°-34'-22"	[illegible]	4.29718'
425	"	[illegible]	[illegible]	4.04441'
450	"	[illegible]	[illegible]	3.81972'
475	"	[illegible]	[illegible]	3.61868'
500	"	2°-51'-53"	[illegible]	3.43775'
525	"	2°-43'-41"	[illegible]	3.27404'
550	"	2°-36'-28"	49.983	3.12522'
575	"	2°-29'-16"	49.984	2.98934'
600	"	2°-22'-14"	[illegible]	2.86479'
700	"	2°-02'-46"	49.988	2.45553'
800	"	1°-47'-29"	49.992	2.14859'
900	"	1°-35'-30"	49.994	1.90986'
1000	"	1°-26'-03"	49.995	1.71887'
1100	"	1°-18'-[illegible]	49.995	1.56261'
1200	"	1°-11'-[illegible]	49.996	1.43239'
1300	"	1°-05'-[illegible]	49.996	1.32221'
1400	"	1°-01'-[illegible]	49.997	1.22777'
1500	"	0°-57'-[illegible]	49.997	1.14592'
1600	"	0°-53'-[illegible]	49.998	1.07430'
1700	"	0°-50'-33.3"	49.998	1.01110'
1800	"	0°-47'-44.[illegible]	49.998	0.95493'
1900	"	0°-45'-[illegible]	49.998	0.90467'
2000	"	0°-42'-[illegible]	49.998	0.85944
2250	"	0°-38'-[illegible]	49.998	0.76394'
2500	"	0°-34'-[illegible]	49.998	0.68755'
2750	"	0°-31'-[illegible]	[illegible]	0.62504'
3000	"	0°-28'-[illegible]	[illegible]	0.57296'
3250	"	0°-26'-[illegible]	[illegible]	0.52868'
3500	"	0°-24'-[illegible]	[illegible]	0.49111'
3750	"	0°-22'-[illegible]	[illegible]	0.45837'
4000	"	0°-21'-30"	[illegible]	0.42972'
4250	"	0°-20'-11"	[illegible]	0.40444'
4500	"	0°-19'-06"	[illegible]	0.38197'
4750	"	0°-18'-[illegible]	[illegible]	0.36187'
5000	"	0°-17'-11"	[illegible]	0.34377'
5500	"	0°-15'-[illegible]	[illegible]	0.31252'
6000	"	0°-14'-[illegible]	[illegible]	0.28648'

S-24

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 68°

		0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
66°	70	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
64°	72	192	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
62°	74	128	384	641	897	1153	1410	1666	1923	2179	2436	2692	2948	3205	3461	3717	3974
60°	76	96	288	480	673	865	1057	1250	1442	1634	1827	2019	2211	2403	2596	2788	2980
58°	78	78	230	384	538	692	846	1000	1153	1307	1461	1615	1769	1923	2076	2230	2384
56°	80	64	192	320	448	576	705	833	961	1089	1217	1346	1474	1602	1730	1858	1987
54°	82	64	164	274	384	494	604	714	824	934	1043	1153	1263	1373	1483	1593	1703
52°	84	48	144	240	336	432	528	625	721	817	913	1009	1105	1201	1298	1394	1490
50°	86	42	128	213	299	384	470	555	641	726	811	897	982	1068	1153	1239	1324
48°	88	38	115	192	269	346	423	500	576	653	730	807	884	961	1038	1115	1192
46°	90	34	104	174	244	314	384	454	524	594	664	734	804	874	944	1013	1083
44°	92	32	96	160	224	288	352	416	480	544	608	673	737	801	865	929	993
42°	94	30	90	147	205	266	325	384	443	502	562	621	680	739	798	857	917
40°	96	28	84	137	192	247	302	357	413	467	521	576	631	686	741	796	851
38°	98	26	78	128	179	230	282	333	384	435	487	538	589	641	692	743	794
36°	100	24	72	120	168	216	264	312	360	408	456	504	552	600	649	697	745
34°	102	22	66	113	158	203	248	294	339	384	429	475	520	565	610	656	701
32°	104	21	64	106	149	192	235	277	320	363	405	448	491	534	576	619	662
30°	106	20	60	101	141	182	222	263	303	344	384	425	466	506	546	587	627
28°	108	19	57	96	134	173	211	250	288	326	365	403	442	480	519	557	596
26°	110	18	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
24°	112	17	52	87	122	157	192	227	262	297	332	367	402	437	472	506	541
22°	114	17	50	83	117	150	183	217	250	284	317	351	384	418	451	484	518
20°	116	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
18°	118	15	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
16°	120	14	44	73	103	133	162	192	221	251	281	310	340	369	399	428	458

225
Sue 14