405963

R

25 February 1959

TO: Jobsite Engineering Files

Subject: INSPECTION OF WEATHER STATIONS.

During the time elapsed from February 16 to February 24, 1959, survey teams inspected the weather station facilities at the following stations and reported no evidence of vandalism or major disrepair.

Ujelang

Kapingamarangi

Kusaie

Wotho

Utirik

Inspection of the facilities at Rongelap was prevented by rough seas.

R.R.Gunny/jm
2/25/59

GEOGRAPHIC POSITIONS

LOCALITY ______ DATUM ______ ______ ORDER TRIANGULATION

STATION	LATITUDE AND LONGITUDE	SECONDS IN METERS	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE		
						LOGARITHM METERS	METERS	FEET

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HOLMES & NARVER, INC. ENGINEERS JOB NO. ______

GEOGRAPHIC POSITIONS

LOCALITY ______ DATUM ______ ORDER TRIANGULATION

STATION	LATITUDE AND LONGITUDE	SECONDS IN METERS		AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE		
							LOGARITHM METERS	METERS	FEET

Computed By Checked By Date TRAVERSE OF Field Book Field Sketch

	Station	Bearing	Distance	Cosine	Sine	Latitude		Departure		Coordinates		Station
						North	South	East	West	North	East	

COMPUTED CHECKED DATE

BEARING & DISTANCE DEVELOPMENT

FIELD BOOK PAGE LOCATION

STATION	COORDINATES		DIFFERENCE		TANGENT	ANGLE	COSINE	BEARING	DISTANCE	FROM STATION	TO STATION
	NORTH	EAST	LATITUDE	DEPARTURE							

COMPUTED ____ CHECKED ____ DATE ____

BEARING & DISTANCE DEVELOPMENT

FIELD BOOK ____ PAGE ____ LOCATION ____

STATION	COORDINATES		DIFFERENCE		TANGENT	ANGLE	COSINE	BEARING	DISTANCE	FROM STATION	TO STATION
	NORTH	EAST	LATITUDE	DEPARTURE							

Computed By Checked By Date TRAVERSE OF Field Book Field Sketch

Station	Bearing	Distance	Cosine	Sine	Latitude North	Latitude South	Departure East	Departure West	Coordinates North	Coordinates East	Station

COMPENSATION FOR CURVATURE – CUBIC YARDAGE CALCULATIONS

(DISTANCE BETWEEN SECTIONS: RADIUS :: X : RADIUS + AVERAGE DISTANCE FROM ℄ TO CENTER OF GRAVITY)

DISTANCE IN FEET FROM CENTER LINE OF ROADBED TO CENTER OF GRAVITY OF SECTION

FACTORS FOR REDUCING DISTANCE BETWEEN CENTERS OF GRAVITY ON CURVES OF VARIOUS RADII

RADIUS OF CURVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
100	.01	.02	.03	.04	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15	.16	.17	.18	.19	.20
125	.01	.02	.02	.03	.04	.05	.06	.06	.07	.08	.09	.10	.10	.11	.12	.13	.14	.14	.15	.16
150	.01	.01	.02	.03	.03	.04	.05	.05	.06	.07	.07	.08	.09	.09	.10	.11	.11	.12	.13	.13
175	.01	.01	.02	.02	.03	.03	.04	.05	.05	.06	.06	.07	.07	.08	.09	.09	.10	.10	.11	.11
200	.00	.01	.02	.02	.03	.03	.04	.04	.05	.05	.06	.06	.07	.07	.08	.08	.09	.09	.10	.10
225	.00	.01	.01	.02	.02	.03	.03	.04	.04	.04	.05	.05	.06	.06	.07	.07	.08	.08	.08	.09
250	.00	.01	.01	.02	.02	.02	.03	.03	.04	.04	.04	.05	.05	.06	.06	.06	.07	.07	.08	.08
275	.00	.01	.01	.01	.02	.02	.03	.03	.03	.04	.04	.04	.05	.05	.05	.06	.06	.07	.07	.07
300	.00	.01	.01	.01	.02	.02	.02	.03	.03	.03	.04	.04	.04	.05	.05	.05	.06	.06	.06	.07
325	.00	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.04	.04	.04	.05	.05	.05	.06	.06	.06
350	.00	.01	.01	.01	.01	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.05	.05	.05	.05	.06
375	.00	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.05	.05	.05	.05
400	.00	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.04	.05	.05	.05
425	.00	.00	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.04	.04	.05
450	.00	.00	.01	.01	.01	.01	.02	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.04	.04
475	.00	.00	.01	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.03	.04	.04	.04	.04
500	.00	.00	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.03	.03	.03	.03	.03	.04	.04	.04
550	.00	.00	.01	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.03	.03	.03	.03	.03	.03	.04
600	.00	.00	.01	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.02	.03	.03	.03	.03	.03	.03
650	.00	.00	.01	.01	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.02	.02	.03	.03	.03	.03

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	RADIUS OF CURVE
.21	.22	.23	.24	.25	.26	.27	.28	.29	.30	.31	.32	.33	.34	.35	.36	.37	.38	.39	.40	100
.17	.18	.18	.19	.20	.21	.22	.22	.23	.24	.25	.26	.26	.27	.28	.29	.30	.30	.31	.32	125
.14	.15	.15	.16	.17	.17	.18	.19	.19	.20	.21	.21	.22	.23	.23	.24	.25	.25	.26	.27	150
.12	.13	.13	.14	.14	.15	.15	.16	.17	.17	.18	.18	.19	.19	.20	.21	.21	.22	.22	.23	175
.11	.11	.12	.12	.13	.13	.14	.14	.15	.15	.16	.16	.17	.17	.18	.18	.19	.19	.20	.20	200
.09	.10	.10	.11	.11	.12	.12	.12	.13	.13	.14	.14	.15	.15	.16	.16	.16	.17	.17	.18	225
.08	.09	.09	.10	.10	.10	.11	.11	.12	.12	.12	.13	.13	.14	.14	.14	.15	.15	.16	.16	250
.08	.08	.08	.09	.09	.09	.10	.10	.11	.11	.11	.12	.12	.12	.13	.13	.13	.14	.14	.15	275
.07	.07	.08	.08	.08	.09	.09	.09	.10	.10	.10	.11	.11	.11	.12	.12	.12	.13	.13	.13	300
.06	.07	.07	.07	.08	.08	.08	.09	.09	.09	.10	.10	.10	.10	.11	.11	.11	.12	.12	.12	325
.06	.06	.07	.07	.07	.07	.08	.08	.08	.09	.09	.09	.09	.10	.10	.10	.11	.11	.11	.11	350
.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.09	.09	.09	.09	.10	.10	.10	.10	.11	375
.05	.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08	.09	.09	.09	.09	.10	.10	.10	400
.05	.05	.05	.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08	.08	.09	.09	.09	.09	425
.05	.05	.05	.05	.06	.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08	.08	.09	.09	450
.04	.05	.05	.05	.05	.05	.06	.06	.06	.06	.07	.07	.07	.07	.07	.08	.08	.08	.08	.08	475
.04	.04	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	.07	.07	.07	.07	.07	.08	.08	.08	500
.04	.04	.04	.04	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	.07	.07	.07	.07	.07	550
.04	.04	.04	.04	.04	.04	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	.06	.07	.07	600
.03	.03	.04	.04	.04	.04	.04	.04	.04	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	650

EXAMPLE:– RADIUS OF CURVE 150 FT.

SECTION 175+50 DISTANCE FROM CENTERLINE OF ROADBED TO CENTER OF GRAVITY OF SECTION = 5 FT.
SECTION 175+88 " " " " " " " " " " " = 7 FT.
AVERAGE " " " " " " " " " " " = 6 FT.
DISTANCE BETWEEN SECTIONS ON CENTERLINE OF ROADBED = 38 FT. FROM TABLE, RADIUS 150 FT. 6 FT. OUT = .04. 38 X .04 = 1.52
38 + 1.52 = 39.52 FT. DISTANCE BETWEEN SECTIONS IF CENTER OF GRAVITY IS ON OUTSIDE OF CURVE
38 – 1.52 = 36.48 FT. DISTANCE BETWEEN SECTIONS IF CENTER OF GRAVITY IS ON INSIDE OF CURVE

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COMPENSATION FOR CURVATURE — CUBIC YARDAGE CALCULATIONS

(DISTANCE BETWEEN SECTIONS: RADIUS :: X : RADIUS + AVERAGE DISTANCE FROM ℄ TO CENTER OF GRAVITY)

DISTANCE IN FEET FROM CENTER LINE OF ROADBED TO CENTER OF GRAVITY OF SECTION — FACTORS FOR REDUCING DISTANCE BETWEEN CENTERS OF GRAVITY ON CURVES OF VARIOUS RADII

RADIUS OF CURVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
100	.01	.02	.03	.04	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15	.16	.17	.18	.19	.20
125	.01	.02	.02	.03	.04	.05	.06	.06	.07	.08	.09	.10	.10	.11	.12	.13	.14	.14	.15	.16
150	.01	.01	.02	.03	.03	.04	.05	.05	.06	.07	.07	.08	.09	.09	.10	.11	.11	.12	.13	.13
175	.01	.01	.02	.02	.03	.03	.04	.05	.05	.06	.06	.07	.07	.08	.09	.09	.10	.10	.11	.11
200	.00	.01	.02	.02	.03	.03	.04	.04	.05	.05	.06	.06	.07	.07	.08	.08	.09	.09	.10	.10
225	.00	.01	.01	.02	.02	.03	.03	.04	.04	.04	.05	.05	.06	.06	.07	.07	.08	.08	.08	.09
250	.00	.01	.01	.02	.02	.02	.03	.03	.04	.04	.04	.05	.05	.06	.06	.06	.07	.07	.08	.08
275	.00	.01	.01	.01	.02	.02	.03	.03	.03	.04	.04	.04	.05	.05	.05	.06	.06	.07	.07	.07
300	.00	.01	.01	.01	.02	.02	.02	.03	.03	.03	.04	.04	.04	.05	.05	.05	.06	.06	.06	.07
325	.00	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.04	.04	.04	.05	.05	.05	.06	.06	.06
350	.00	.01	.01	.01	.01	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.05	.05	.05	.05	.06
375	.00	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.05	.05	.05	.05
400	.00	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.04	.05	.05	.05
425	.00	.00	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.04	.04	.05
450	.00	.00	.01	.01	.01	.01	.02	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.04	.04	.04
475	.00	.00	.01	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.03	.03	.04	.04	.04	.04
500	.00	.00	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.03	.03	.03	.03	.03	.04	.04	.04
550	.00	.00	.01	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.03	.03	.03	.03	.03	.03	.04
600	.00	.00	.01	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.02	.03	.03	.03	.03	.03	.03
650	.00	.00	.01	.01	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.02	.02	.03	.03	.03	.03

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	RADIUS OF CURVE
.21	.22	.23	.24	.25	.26	.27	.28	.29	.30	.31	.32	.33	.34	.35	.36	.37	.38	.39	.40	100
.17	.18	.18	.19	.20	.21	.22	.22	.23	.24	.25	.26	.26	.27	.28	.29	.30	.30	.31	.32	125
.14	.15	.16	.16	.17	.17	.18	.19	.19	.20	.21	.21	.22	.23	.23	.24	.25	.25	.26	.27	150
.12	.13	.13	.14	.14	.15	.15	.16	.17	.17	.18	.18	.19	.19	.20	.21	.21	.22	.22	.23	175
.11	.11	.12	.12	.13	.13	.14	.14	.15	.15	.16	.16	.17	.17	.18	.18	.19	.19	.20	.20	200
.09	.10	.10	.11	.11	.12	.12	.12	.13	.13	.14	.14	.15	.15	.16	.16	.16	.17	.17	.18	225
.08	.09	.09	.10	.10	.10	.11	.11	.12	.12	.12	.13	.13	.14	.14	.14	.15	.15	.16	.16	250
.08	.08	.08	.09	.09	.09	.10	.10	.11	.11	.11	.12	.12	.12	.13	.13	.13	.14	.14	.15	275
.07	.07	.08	.08	.08	.09	.09	.09	.10	.10	.10	.11	.11	.11	.12	.12	.12	.13	.13	.13	300
.06	.07	.07	.07	.08	.08	.08	.09	.09	.09	.10	.10	.10	.10	.11	.11	.11	.12	.12	.12	325
.06	.06	.07	.07	.07	.07	.08	.08	.08	.09	.09	.09	.09	.10	.10	.10	.11	.11	.11	.11	350
.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.09	.09	.09	.09	.10	.10	.10	.10	.11	375
.05	.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08	.09	.09	.09	.09	.10	.10	.10	400
.05	.05	.05	.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08	.08	.09	.09	.09	.09	425
.05	.05	.05	.05	.06	.06	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08	.08	.09	.09	450
.04	.05	.05	.05	.05	.05	.06	.06	.06	.06	.07	.07	.07	.07	.07	.08	.08	.08	.08	.08	475
.04	.04	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	.07	.07	.07	.07	.07	.08	.08	.08	500
.04	.04	.04	.04	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	.07	.07	.07	.07	.07	550
.04	.04	.04	.04	.04	.04	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	.06	.07	.07	600
.03	.03	.04	.04	.04	.04	.04	.04	.04	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06	.06	650

EXAMPLE — RADIUS OF CURVE 150 FT. [illegible]

SECTION 175+50 DISTANCE FROM CENTERLINE OF ROADBED TO CENTER OF GRAVITY OF SECTION = 5 FT.

SECTION 175+88 " " " " " " " " " = 7 FT.

AVERAGE = 6 FT.

DISTANCE BETWEEN SECTIONS ON CENTERLINE OF ROADBED = 38 FT. FROM TABLE, RADIUS 150 FT., 6 FT. OUT = .04. 38 X .04 = 1.52 [illegible]

38 + 1.52 = 39.52 FT. DISTANCE BETWEEN SECTIONS IF CENTER OF GRAVITY IS ON OUTSIDE OF CURVE

38 − 1.52 = 36.48 FT. DISTANCE BETWEEN SECTIONS IF CENTER OF GRAVITY IS ON INSIDE OF CURVE

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SURVEY DEPARTMENT — MONTHLY TIME RECORD

JOB NO. ______ LOCATION ______________

MONTH ______________ YEAR ______________

OVERTIME / STRAIGHT TIME [2/8]

O = OFF WITHOUT PAY
S = SICK LEAVE
A = ANNUAL LEAVE

NAME	CLASSIFICATION	RATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	REMARKS

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SURVEY DEPARTMENT — MONTHLY TIME RECORD

JOB NO. — LOCATION

MONTH — YEAR

OVERTIME / STRAIGHT TIME [2/8]

O = OFF WITHOUT PAY
S = SICK LEAVE
A = ANNUAL LEAVE

NAME	CLASSIFICATION	RATE	1	2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	REMARKS

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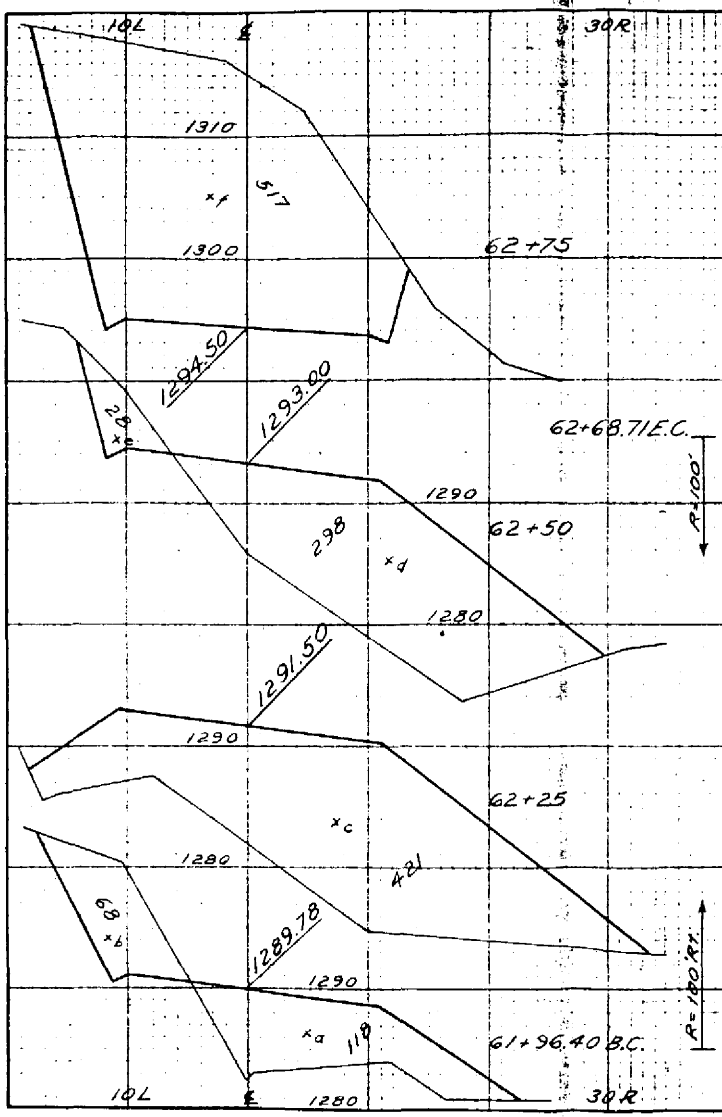
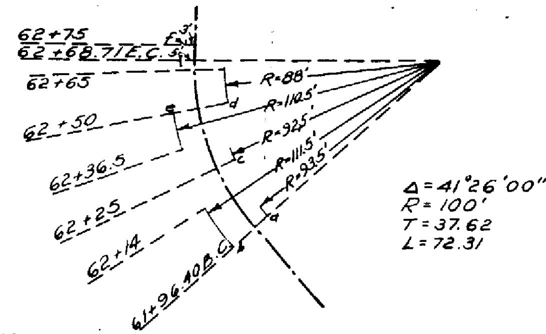
COMPENSATION FOR CURVATURE – CUBIC YARDAGE CALCULATIONS



METHOD OF COMPENSATING DISTANCE BETWEEN STATIONS OF CROSS SECTIONS TAKEN ON CURVES



In the cross sections at the left, and in the above plan, points x_a, x_b, x_c....., and points a, b, c ....., respectively, indicate the location of the centers of gravity of the end areas with respect to centerline.

The compensated distance between adjacent sections is to the distance between their stations as the radius at the average center of gravity is to the center line radius.

If the roadbed runs out of, or into, cut or fill between sections, the compensated distance to or from the end or beginning, respectively, of cut or fill, is to the centerline distance as the radius to the center of gravity of the adjacent section is to the centerline radius. The centerline distance may be graphically determined thus: first, plot from the cross sections a profile through the zero point of cut or fill; second, scale distance from adjacent section to grade point on profile. Computations for sections shown:

$D_{a-c} : 28.60 :: \frac{93.5 + 92.5}{2} : 100$; whence $D_{a-c} = 28.60 \times 0.93 = 26.6$.

$D_{c-d} : 25.00 :: \frac{92.5 + 88.0}{2} : 100$; whence $D_{c-d} = 25 \times 0.9025 = 22.6$.

$D_{d-0} : 15$ (scaled) $:: 88 : 100$; whence $D_{d-0} = 15 \times 0.88 = 13.2$.

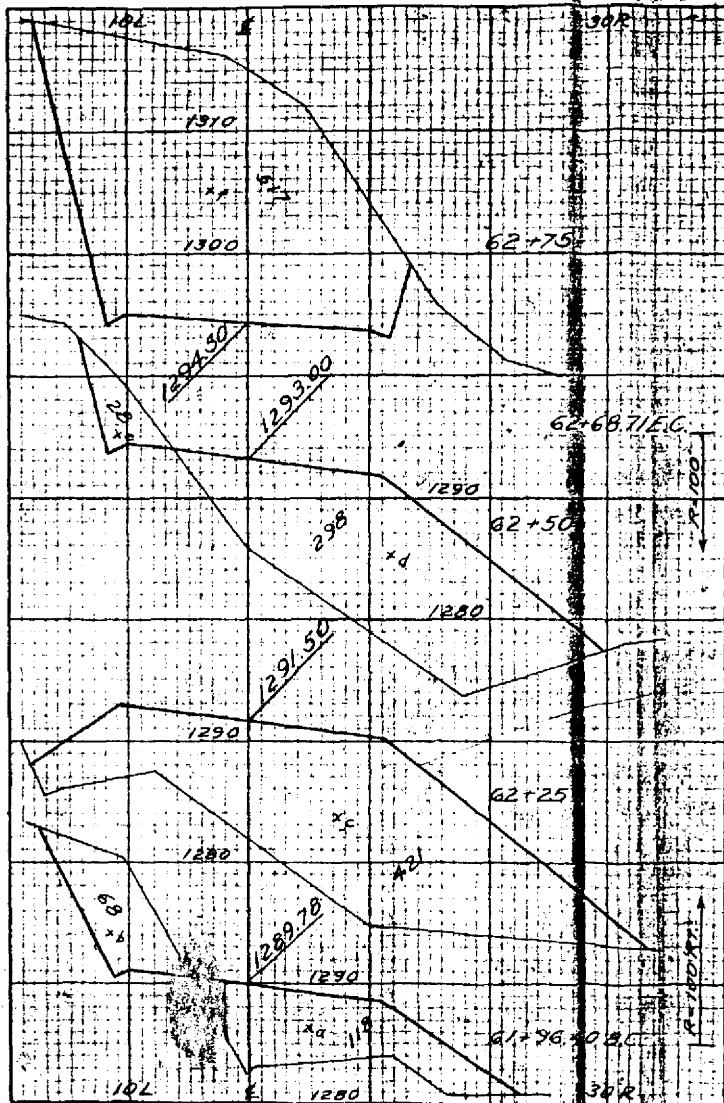
$D_{b-0} : 17.6$ (scaled) $:: 111.5 : 100$; whence $D_{b-0} = 17.6 \times 1.115 = 19.6$.

$D_{0-e} : 13.5$ (scaled) $:: 110.5 : 100$; whence $D_{0-e} = 13.5 \times 1.105 = 14.9$.

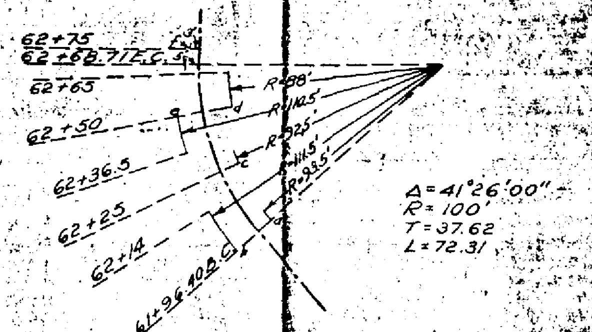
When a B.C. or an E.C. lies between adjacent sections, compensate distance for curved portion of earthwork and add to it the tangent distance to obtain compensated distance. Proportion between the centers of gravity at the tangent and curve sections for the center gravity at the B.C. or E.C. and apply the general formula. Computation: by proportion the center of gravity at 62 + 68.71 E.C. is found to be approximately 5 feet to the left of the centerline. Therefore

$D_{e-E.C.} : 18.71 :: \frac{110.5 + 105.0}{2} : 100$; whence $D_{e-E.C.} = 18.71 \times 1.0775 = 20.2$.

$D_{e-f} = 20.2 \quad 6.3 = 26.5$.



METHOD OF COMPENSATING DISTANCE BETWEEN STATIONS OF CROSS SECTIONS TAKEN ON CURVES



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The compensated distance between adjacent sections is to the distance between their stations as the radius at the average center of gravity is to the center line radius.

If the roadbed runs out of, or into, cut or fill between sections, the compensated distance to or from the end or beginning, respectively, of cut or fill, is to the centerline distance as the radius to the center of gravity of the adjacent section is to the centerline radius. The centerline distance may be graphically determined thus: first, plot from the cross sections a profile through the zero point of cut or fill; second, scale distance from adjacent section to grade point on profile. Computation for sections shown:

$$D_{a-c} : 28.60 :: \frac{93.5 + 92.5}{2} : 100; \text{ whence } D_{a-c} = 28.60 \times 0.93 = 26.6.$$

$$D_{c-d} : 25.00 :: \frac{92.5 + 88.0}{2} : 100; \text{ whence } D_{c-d} = 25 \times 0.9025 = 22.6.$$

$$D_{d-o} : 15 \text{ (scaled)} :: 88 : 100; \text{ whence } D_{d-o} = 15 \times 0.88 = 13.2$$

$$D_{b-o} : 17.6 \text{ (scaled)} :: 111.5 : 100; \text{ whence } D_{b-o} = 17.6 \times 1.115 = 19.6.$$

$$D_{o-e} : 13.5 \text{ (scaled)} :: 110.5 : 100; \text{ whence } D_{o-e} = 13.5 \times 1.105 = 14.9.$$

When a B.C. or an E.C. lies between adjacent sections, compensate distance for curved portion of earthwork and add to it the tangent distance to obtain compensated distance. Proportion between the centers of gravity at the tangent and curve sections for the center gravity at the B.C. or E.C. and apply the general formula. Computation: by proportion the center of gravity at 62 + 68.71 E.C. is found to be approximately 5 feet to the left of the centerline. Therefore

$$D_{e-EC} : 18.71 :: \frac{110.5 + 105.0}{2} : 100; \text{ whence } D_{e-EC} = 18.71 \times 1.0775 = 20.2.$$

$$D_{e-f} = 20.2 \quad 6.3 = 26.5.$$

HOLMES & NARVER INC, ENGINEERS

JOB NO. ____

COMPUTATION OF __________ BASELINE

SECTION	DATE	DIR OF MEAS	TAPE NO.	TAPE SUPPORT	UNCORRECTED LENGTH		TEMP.						REDUCED LENGTH	ADOPTED LENGTH	(V)	(VV)
					TAPE LNGTH	METERS		TEMP	TAPE AND CATENARY	SET-UP SET-BACK	INCLINATION	SEA LEVEL				
							°C	METERS	METERS	METERS	METERS	METERS	METERS	METERS	MM.	MM.

HOLMES

COMPUTATION OF ________ BASELINE

SECTION	DATE	DIR OF MEAS	TAPE NO.	TAPE SUPPORT	UNCORRECTED LENGTH		TEMP.						REDUCED LENGTH	ADOPTED LENGTH	(V)	(VV)
					TAPE LENGTHS	METERS		TEMP	TAPE AND CATENARY	SET-UP SET-BACK	INCLINATION	SEA LEVEL				
							°C	METERS	METERS	METERS	METERS	METERS	METERS	METERS	MM.	MM.

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