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A-3 Results of Lugeon Test in Drillhole

Tab.A-3-1 Results of Permeability Test

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Tab.A-3-2 Data of Permeability Test and P-Q Curve (18/19)

Tab.A-3-2 Data of Permeability Test and P-Q Curve (19/19)

Table A-3-1 Results of Permeability Test

Drillhole No.	Location Tested m	Lugeon Value	Max. Press. kgf/cm ²	Remarks
PHLL1SP	11.00 - 12.50	-	-	No Return
	20.00 - 21.50	-	-	No Return
	30.00 - 31.50	-	-	No Return
	40.00 - 41.50	-	-	No Return
	50.00 - 51.50	-	-	No Return
	60.00 - 61.50	-	-	No Return
	68.90 - 70.40	-	-	No Return
PHLL2SP	10.00 - 11.50	-	-	No Return
	20.00 - 21.50	-	-	No Return
	30.00 - 31.50	-	-	No Return
	40.00 - 41.50	-	-	No Return
	50.00 - 51.50	-	-	No Return
	60.00 - 61.50	-	-	No Return
	74.90 - 76.40	0	12.59	
	77.50 - 83.00	0	19.85	
81.50 - 83.00	-	-	No Return	
PHLL3SP	8.50 - 10.00	-	-	No Return
	17.75 - 19.50	1	13.88	
	21.50 - 23.00	3	14.25	
	30.35 - 31.85	9	15.14	
	34.30 - 35.80	3	15.53	
	36.30 - 37.80	7	15.73	
	46.50 - 48.00	3	16.75	
	68.90 - 70.40	3	18.99	
PHLL4SP	10.40 - 11.90	-	-	No Return
	11.90 - 13.40	37	13.29	Over flow during test
	14.70 - 16.20	23	13.57	
	29.95 - 31.45	10	15.1	
	40.30 - 41.80	55	12.13	
	45.20 - 46.70	0	16.62	
	46.60 - 48.10	1	16.76	
PHLL9CM	15.75 - 17.25	5	6.68	Calculated Lugeon Value
	16.50 - 18.00	0	9.75	Calculated Lugeon Value
PHLL14CM	12.15 - 13.65	2	11.32	Possibility of Leak between Packer and Hole Wall
	19.85 - 21.35	1	12.09	

Note: Location tested, pressure and flow data were offered by ICE.

Table A-3-2 Data of Permeability Test and P-Q Curve (1/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos

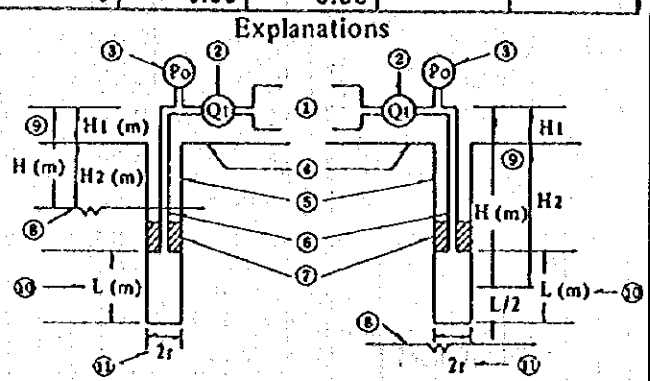
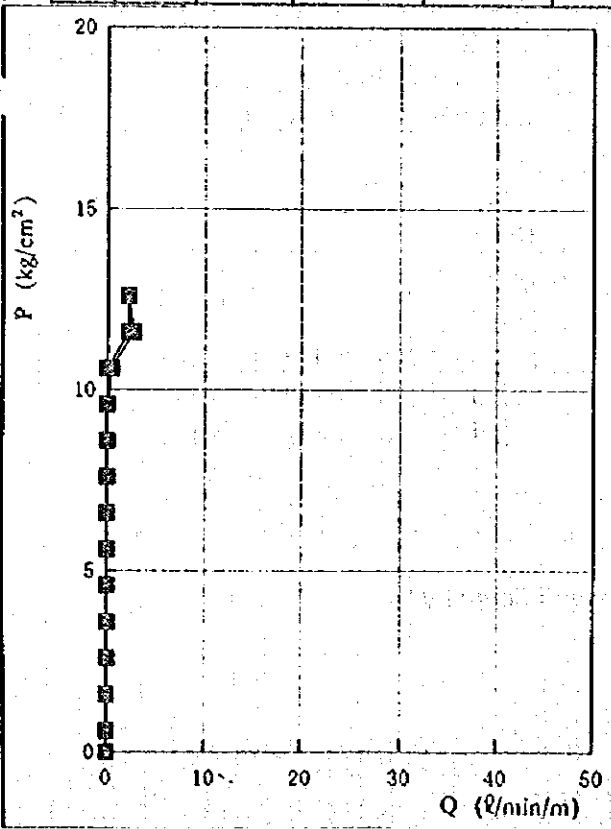
PROJECT

HOLE No PHLL2SP

LOCATION Dam Site DEPTH OF HOLE 83.30 m TEST DATE _____
 ELEVATION 510.332 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 481,063.003; 388,204.095 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL vertical LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 74.90 m TO 76.40 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	4.90	4.90	0.00	0.59	5	0	0.00	0.00		
1	4.90	4.90	1.00	1.59	5	0	0.00	0.00		
1	4.90	4.90	2.00	2.59	5	0	0.00	0.00		
1	4.90	4.90	3.00	3.59	5	0	0.00	0.00		
1	4.90	4.90	4.00	4.59	5	0	0.00	0.00		
1	4.90	4.90	5.00	5.59	5	0	0.00	0.00		
1	4.90	4.90	6.00	6.59	5	0	0.00	0.00		
1	4.90	4.90	7.00	7.59	5	0	0.00	0.00		
1	4.90	4.90	8.00	8.59	5	0	0.00	0.00		
1	4.90	4.90	9.00	9.59	5	0	0.00	0.00		
1	4.90	4.90	10.00	10.59	5	3	0.60	0.40		
1	4.90	4.90	11.00	11.59	5	20.5	4.10	2.73		
1	4.90	4.90	12.00	12.59	10	32.5	3.25	2.17		
1	4.90	4.90	11.00	11.59	5	16.5	3.30	2.20		
1	4.90	4.90	10.00	10.59	5	0	0.00	0.00		
1	4.90	4.90	9.00	9.59	5	0	0.00	0.00		
1	4.90	4.90	8.00	8.59	5	0	0.00	0.00		
1	4.90	4.90	7.00	7.59	5	0	0.00	0.00		
1	4.90	4.90	6.00	6.59	5	0	0.00	0.00		
1	4.90	4.90	5.00	5.59	5	0	0.00	0.00		
1	4.90	4.90	4.00	4.59	5	0	0.00	0.00		
1	4.90	4.90	3.00	3.59	5	0	0.00	0.00		
1	4.90	4.90	2.00	2.59	5	0	0.00	0.00		
1	4.90	4.90	1.00	1.59	5	0	0.00	0.00		
1	4.90	4.90	0.00	0.59	5	0	0.00	0.00		



- Explanations**
- (1) : Pump
 - (2) : Flow meter
 - (3) : Pressure gauge
 - (4) : Ground surface
 - (5) : Drill hole
 - (6) : Injection pipe
 - (7) : Packer
 - (8) : Water table
 - (9) : Hydrostatic head
 - (10) : Length of test section
 - (11) : Diameter of hole
- Po : Gauge pressure
 - H₁ : Height of Pressure gauge
 - H₂ : Depth of Ground water (Saturated Strata)
 - P : Effective pressure
P = P₀ + H(m)/10, H = H₁ + H₂
 - t : Injected time
 - Qt : Water volume during time in "t"
 - Qo : Water volume per one min.
 - Lu : Lugeon value in l/min/m/10kg/cm²
 - K : Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (2/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. **PHLL2SP**

LOCATION Dam Site F DEPTH OF HOLE 83.30 m TEST DATE _____

ELEVATION 510.332 m DIAMETER OF HOLE _____ cm TESTED BY ICE

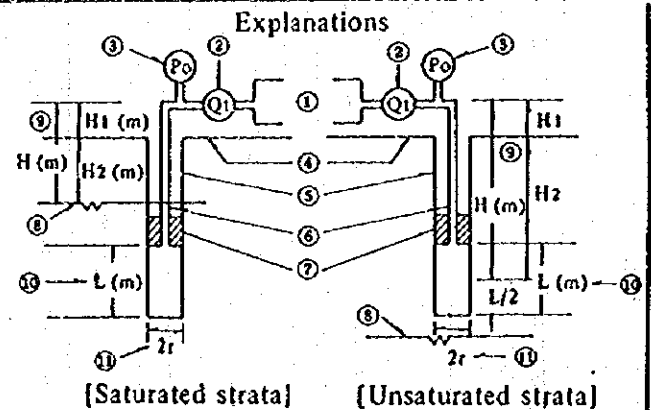
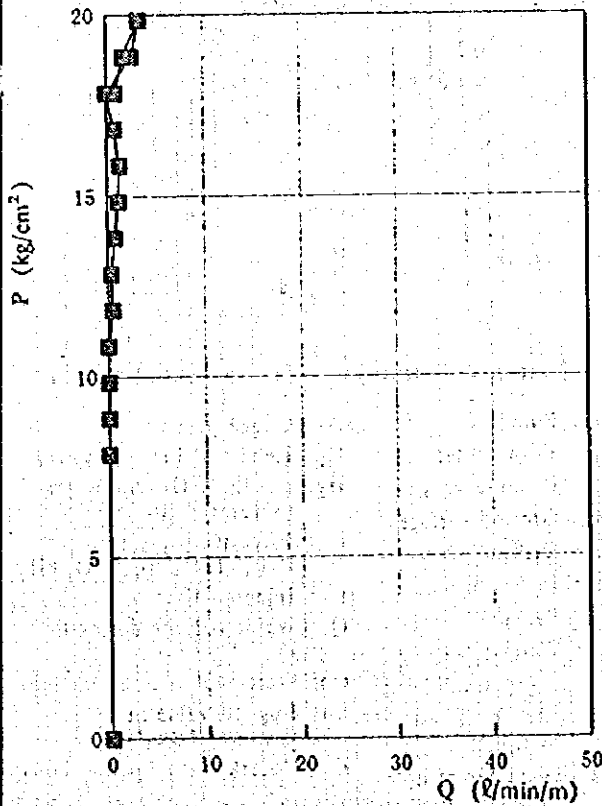
COORDINATE 481,063,003; 388,204,095 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL vertical LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 77.50 m TO 83.00 m

L (m)	H ₁ (m)	H ₂ (m)	P ₀ (kg/cm ²)	P (kg/cm ²)	t (min)	Q _t (l)	Q ₀ (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	77.50	0.00	7.85	5	0	0.00	0.00		
	1	77.50	1.00	8.85	5	0	0.00	0.00		
	1	77.50	2.00	9.85	5	0	0.00	0.00		
	1	77.50	3.00	10.85	5	0	0.00	0.00		
	1	77.50	4.00	11.85	5	13	2.60	0.47		
	1	77.50	5.00	12.85	5	10.5	2.10	0.38		
	1	77.50	6.00	13.85	5	21	4.20	0.76		
	1	77.50	7.00	14.85	5	32.5	6.50	1.18		
	1	77.50	8.00	15.85	5	36	7.20	1.31		
	1	77.50	9.00	16.85	5	21	4.20	0.76		
	1	77.50	10.00	17.85	5	0	0.00	0.00		
	1	77.50	11.00	18.85	5	75	15.00	2.73		
	1	77.50	12.00	19.85	5	96	19.20	3.49		
	1	77.50	11.00	18.85	5	49	9.80	1.78		
	1	77.50	10.00	17.85	5	24.5	4.90	0.89		



- ①: Pump
- ②: Flow meter
- ③: Pressure gauge
- ④: Ground surface
- ⑤: Drill hole
- ⑥: Injection pipe
- ⑦: Packer
- ⑧: Water table
- ⑨: Hydrostatic head
- ⑩: Length of test section
- ⑪: Diameter of hole
- P₀: Gauge pressure
- H₁: Height of Pressure gauge
- H₂: Depth of Ground water (Saturated Strata)
- P: Effective pressure
 $P = P_0 + H(m)/10$, $H = H_1 + H_2$
- t: Injected time
- Q_t: Water volume during time in "t"
- Q₀: Water volume per one min.
- Lu: Lugeon value in l/min/m/10kg/cm²
- K: Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (3/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos

PROJECT

HOLE No. PHLL3SP SP

LOCATION Dam Site F DEPTH OF HOLE 80.00 m TEST DATE _____
 ELEVATION 493.922 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 461,004.527; 388,113.049 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL Vertical LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE _____ BEFORE T _____ m AFTER T _____ m

TEST SECTION FROM 17.75 m TO 19.50 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	17.75	0.00	1.88	5	0	0.00	0.00			
1	17.75	1.00	2.88	5	0	0.00	0.00			
1	17.75	2.00	3.88	5	0	0.00	0.00			
1	17.75	3.00	4.88	5	2	0.40	0.23			
1	17.75	4.00	5.88	5	0	0.00	0.00			
1	17.75	5.00	6.88	5	14	2.80	1.60			
1	17.75	6.00	7.88	5	14	2.80	1.60			
1	17.75	7.00	8.88	5	16	3.20	1.83			
1	17.75	8.00	9.88	5	0	0.00	0.00			
1	17.75	9.00	10.88	5	10	2.00	1.14			
1	17.75	10.00	11.88	5	15	3.00	1.71			
1	17.75	11.00	12.88	5	21	4.20	2.40			
1	17.75	12.00	13.88	10	64	6.40	3.66			
1	17.75	11.00	12.88	5	18	3.60	2.06			
1	17.75	10.00	11.88	5	14	2.80	1.60			
1	17.75	9.00	10.88	5	10	2.00	1.14			
1	17.75	8.00	9.88	5	10	2.00	1.14			
1	17.75	7.00	8.88	5	10	2.00	1.14			
1	17.75	6.00	7.88	5	7	1.40	0.80			
1	17.75	5.00	6.88	5	5	1.00	0.57			
1	17.75	4.00	5.88	5	1	0.20	0.11			
1	17.75	3.00	4.88	5	0	0.00	0.00			
1	17.75	2.00	3.88	5	0	0.00	0.00			
1	17.75	1.00	2.88	5	0	0.00	0.00			
1	17.75	0.00	1.88	5	0	0.00	0.00			

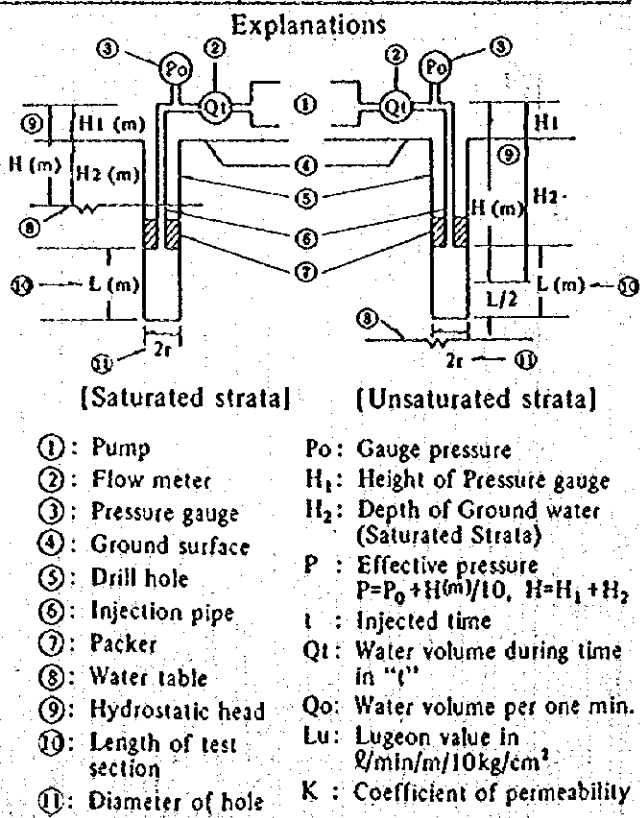
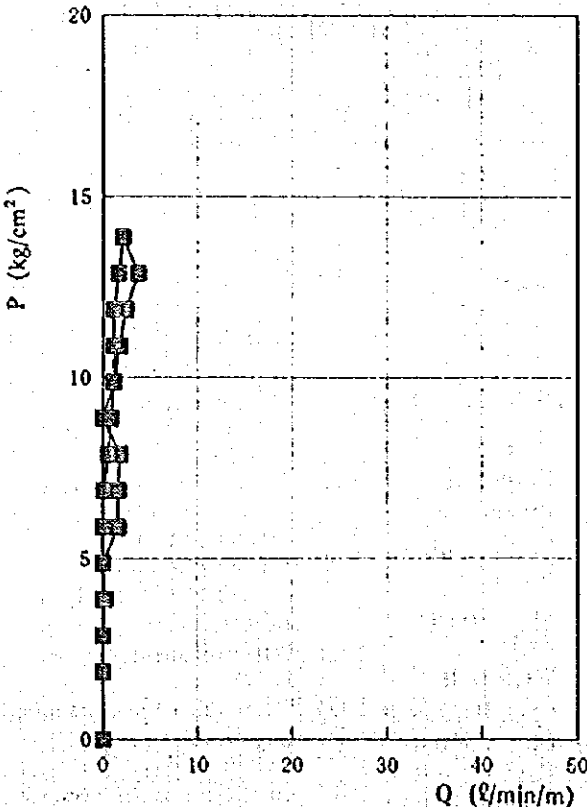


Table A-3-2 Data of Permeability Test and P-Q Curve (4/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. **PHLL3SP**

LOCATION Dam Site DEPTH OF HOLE 80.00 m TEST DATE _____

ELEVATION 493.922 m DIAMETER OF HOLE _____ cm TESTED BY ICE

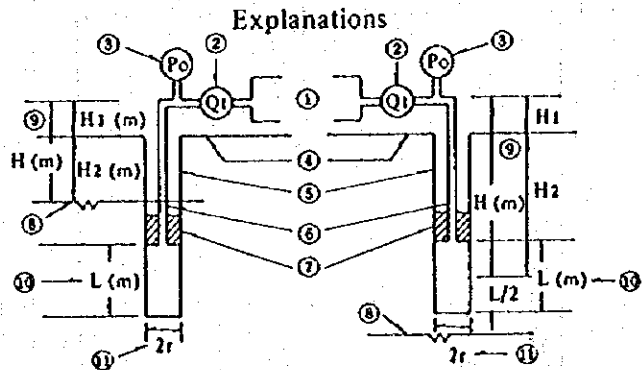
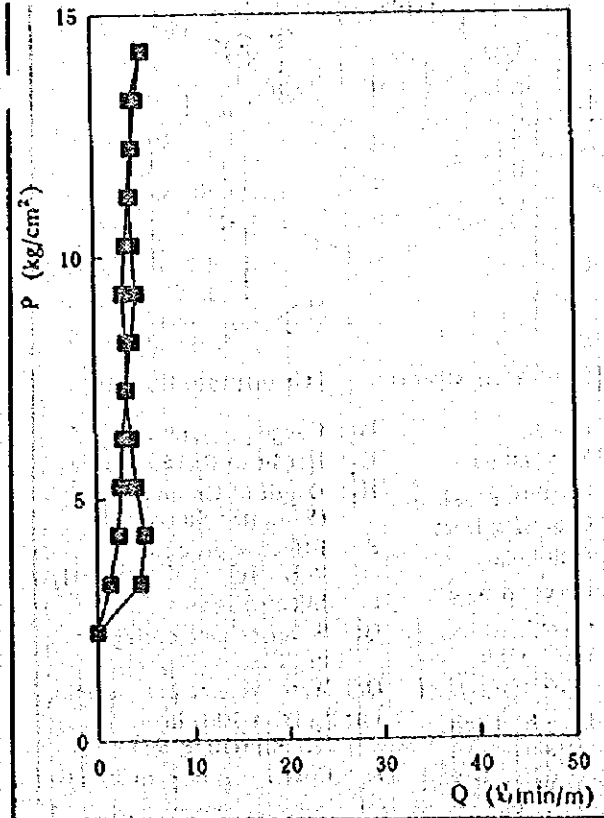
COORDINATE 461,004.527; 388,113.049 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL vertical LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 21.50 m TO 23.00 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	21.50	0.00	2.25	5	0	0.00	0.00			
1	21.50	1.00	3.25	5	34	6.80	4.53			
1	21.50	2.00	4.25	5	38	7.60	5.07			
1	21.50	3.00	5.25	5	31	6.20	4.13			
1	21.50	4.00	6.25	5	28	5.60	3.73			
1	21.50	5.00	7.25	5	24	4.80	3.20			
1	21.50	6.00	8.25	5	29	5.80	3.87			
1	21.50	7.00	9.25	5	33	6.60	4.40			
1	21.50	8.00	10.25	5	30	6.00	4.00			
1	21.50	9.00	11.25	5	29	5.80	3.87			
1	21.50	10.00	12.25	5	31	6.20	4.13			
1	21.50	11.00	13.25	5	30	6.00	4.00			
1	21.50	12.00	14.25	10	78	7.80	5.20			
1	21.50	11.00	13.25	5	34	6.80	4.53			
1	21.50	10.00	12.25	5	30	6.00	4.00			
1	21.50	9.00	11.25	5	27	5.40	3.60			
1	21.50	8.00	10.25	5	25	5.00	3.33			
1	21.50	7.00	9.25	5	22	4.40	2.93			
1	21.50	6.00	8.25	5	25	5.00	3.33			
1	21.50	5.00	7.25	5	25	5.00	3.33			
1	21.50	4.00	6.25	5	21	4.20	2.80			
1	21.50	3.00	5.25	5	19	3.80	2.53			
1	21.50	2.00	4.25	5	17	3.40	2.27			
1	21.50	1.00	3.25	5	10	2.00	1.33			
1	21.50	0.00	2.25	5	0	0.00	0.00			



- [Saturated strata]** **[Unsaturated strata]**
- ①: Pump
 - ②: Flow meter
 - ③: Pressure gauge
 - ④: Ground surface
 - ⑤: Drill hole
 - ⑥: Injection pipe
 - ⑦: Packer
 - ⑧: Water table
 - ⑨: Hydrostatic head
 - ⑩: Length of test section
 - ⑪: Diameter of hole
- Po: Gauge pressure
 - H₁: Height of Pressure gauge
 - H₂: Depth of Ground water (Saturated Strata)
 - P: Effective pressure
 $P = P_0 + H(m)/10$, $H = H_1 + H_2$
 - t: Injected time
 - Qt: Water volume during time in "t"
 - Qo: Water volume per one min.
 - Lu: Lugeon value in l/min/m/10kg/cm²
 - K: Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (5/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos

PROJECT

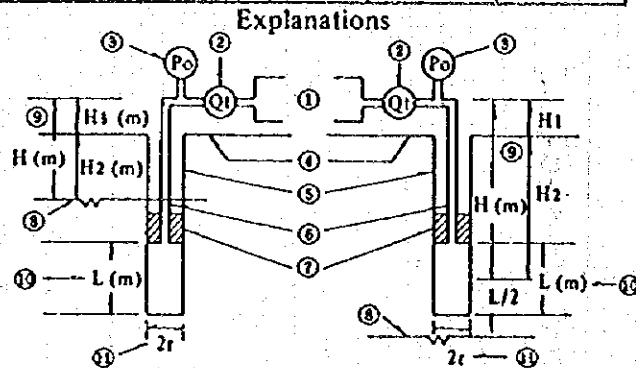
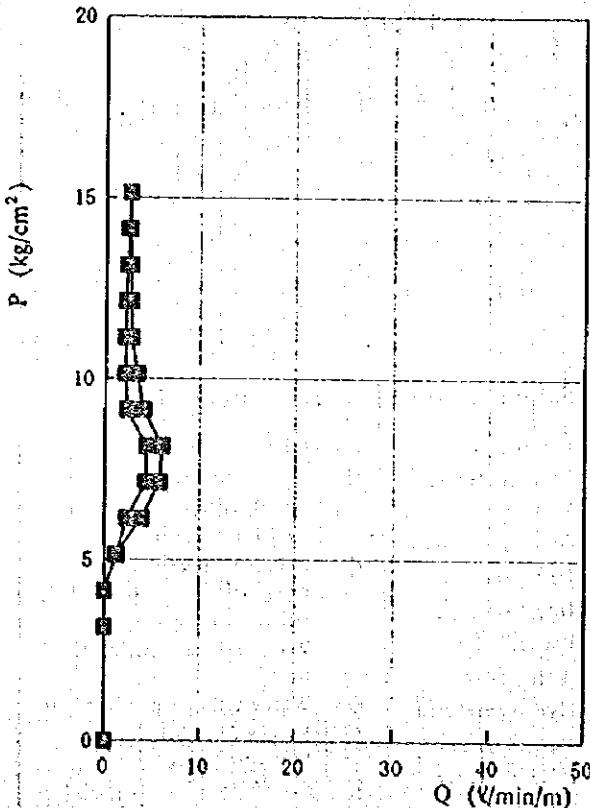
HOLE No.

PHLL3SP; SP

LOCATION Dam Site DEPTH OF HOLE 80.00 m TEST DATE _____
 ELEVATION 493.922 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 481,004.527; 388,113.049 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL Vertical LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 30.35 m TO 31.85 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	1	30.35	0.00	3.14	5	0	0.00	0.00		
1	1	30.35	1.00	4.14	5	0	0.00	0.00		
1	1	30.35	2.00	5.14	5	0	0.00	0.00		
1	1	30.35	3.00	6.14	5	9.2	1.84	1.23		
1	1	30.35	4.00	7.14	5	29	5.80	3.87		
1	1	30.35	5.00	8.14	5	43	8.60	5.73		
1	1	30.35	6.00	9.14	5	45	9.00	6.00		
1	1	30.35	7.00	10.14	5	30	6.00	4.00		
1	1	30.35	8.00	11.14	5	25	5.00	3.33		
1	1	30.35	9.00	12.14	5	21	4.20	2.80		
1	1	30.35	10.00	13.14	5	20	4.00	2.67		
1	1	30.35	11.00	14.14	5	20	4.00	2.67		
1	1	30.35	12.00	15.14	10	38	3.80	2.53		
1	1	30.35	11.00	14.14	5	19.5	3.90	2.60		
1	1	30.35	10.00	13.14	5	18.3	3.66	2.44		
1	1	30.35	9.00	12.14	5	17.4	3.48	2.32		
1	1	30.35	8.00	11.14	5	16.2	3.24	2.16		
1	1	30.35	7.00	10.14	5	16.4	3.28	2.19		
1	1	30.35	6.00	9.14	5	16	3.20	2.13		
1	1	30.35	5.00	8.14	5	17.4	3.48	2.32		
1	1	30.35	4.00	7.14	5	32.6	6.52	4.35		
1	1	30.35	3.00	6.14	5	32.6	6.52	4.35		
1	1	30.35	2.00	5.14	5	17.6	3.52	2.35		
1	1	30.35	1.00	4.14	5	9.8	1.96	1.31		
1	1	30.35	0.00	3.14	5	0	0.00	0.00		



- [Saturated strata] [Unsaturated strata]
- ①: Pump
 - ②: Flow meter
 - ③: Pressure gauge
 - ④: Ground surface
 - ⑤: Drill hole
 - ⑥: Injection pipe
 - ⑦: Packer
 - ⑧: Water table
 - ⑨: Hydrostatic head
 - ⑩: Length of test section
 - ⑪: Diameter of hole
 - Po: Gauge pressure
 - H₁: Height of Pressure gauge
 - H₂: Depth of Ground water (Saturated Strata)
 - P: Effective pressure
 $P = P_0 + H(m)/10, H = H_1 + H_2$
 - t: Injected time
 - Qt: Water volume during time in "t"
 - Qo: Water volume per one min.
 - Lu: Lugeon value in $Q/min/m/10kg/cm^2$
 - K: Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (6/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos ; PROJECT HOLE No. **PHLL3SP SP**

LOCATION **Dam Site E** DEPTH OF HOLE **80.00 m** TEST DATE _____

ELEVATION **493.922 m** DIAMETER OF HOLE _____ cm TESTED BY **ICE**

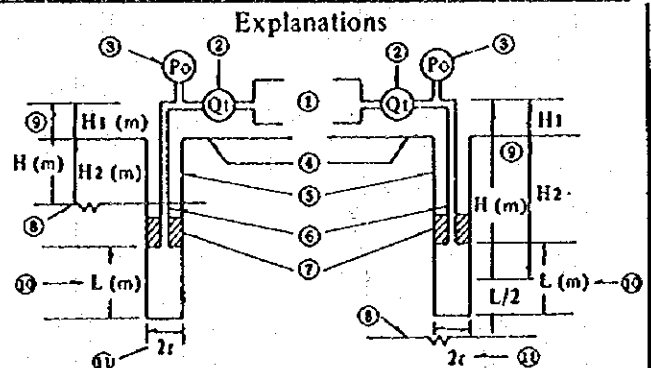
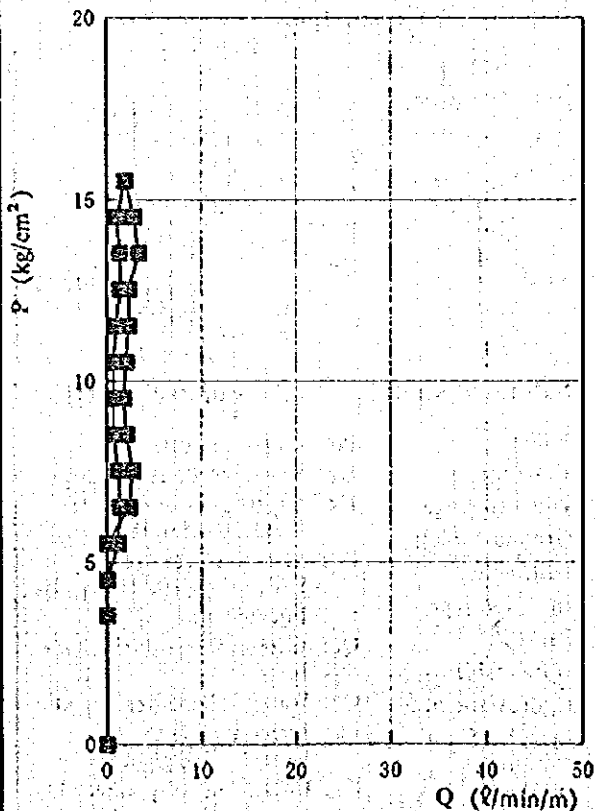
COORDINATE **461,004.527; 388,113.049** DRILLED DEPTH _____ m DRILLED BY **ICE**

ANGLE FROM HORIZONTAL **Vertical** LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM **34.30 m** TO **35.80 m**

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	34.30	0.00	3.53	5	0	0.00	0.00			
1	34.30	1.00	4.53	5	0	0.00	0.00			
1	34.30	2.00	5.53	5	0	0.00	0.00			
1	34.30	3.00	6.53	5	0	0.00	0.00			
1	34.30	4.00	7.53	5	17.5	3.50	2.33			
1	34.30	5.00	8.53	5	20	4.00	2.67			
1	34.30	6.00	9.53	5	15	3.00	2.00			
1	34.30	7.00	10.53	5	12.7	2.54	1.69			
1	34.30	8.00	11.53	5	15	3.00	2.00			
1	34.30	9.00	12.53	5	17.2	3.44	2.29			
1	34.30	10.00	13.53	5	17.3	3.46	2.31			
1	34.30	11.00	14.53	5	25	5.00	3.33			
1	34.30	12.00	15.53	10	42.7	4.27	2.85			
1	34.30	11.00	14.53	5	14.7	2.94	1.96			
1	34.30	10.00	13.53	5	8	1.60	1.07			
1	34.30	9.00	12.53	5	10.5	2.10	1.40			
1	34.30	8.00	11.53	5	10.5	2.10	1.40			
1	34.30	7.00	10.53	5	7	1.40	0.93			
1	34.30	6.00	9.53	5	5	1.00	0.67			
1	34.30	5.00	8.53	5	5	1.00	0.67			
1	34.30	4.00	7.53	5	5	1.00	0.67			
1	34.30	3.00	6.53	5	9	1.80	1.20			
1	34.30	2.00	5.53	5	10	2.00	1.33			
1	34.30	1.00	4.53	5	8.5	1.70	1.13			
1	34.30	0.00	3.53	5	0	0.00	0.00			



- Explanations**
- ①: Pump
 - ②: Flow meter
 - ③: Pressure gauge
 - ④: Ground surface
 - ⑤: Drill hole
 - ⑥: Injection pipe
 - ⑦: Packer
 - ⑧: Water table
 - ⑨: Hydrostatic head
 - ⑩: Length of test section
 - ⑪: Diameter of hole
- P₀: Gauge pressure
 - H₁: Height of Pressure gauge
 - H₂: Depth of Ground water (Saturated Strata)
 - P: Effective pressure
 $P = P_0 + H(m)/10$, $H = H_1 + H_2$
 - t: Injected time
 - Q_t: Water volume during time in "t"
 - Q₀: Water volume per one min.
 - Lu: Lugeon value in
 $l/min/m/10kg/cm^2$
 - K: Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (7/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

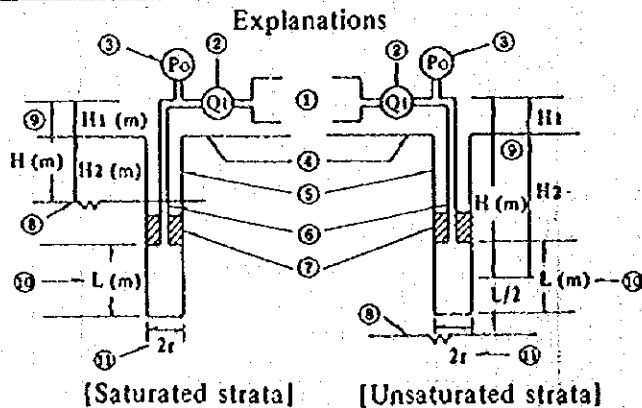
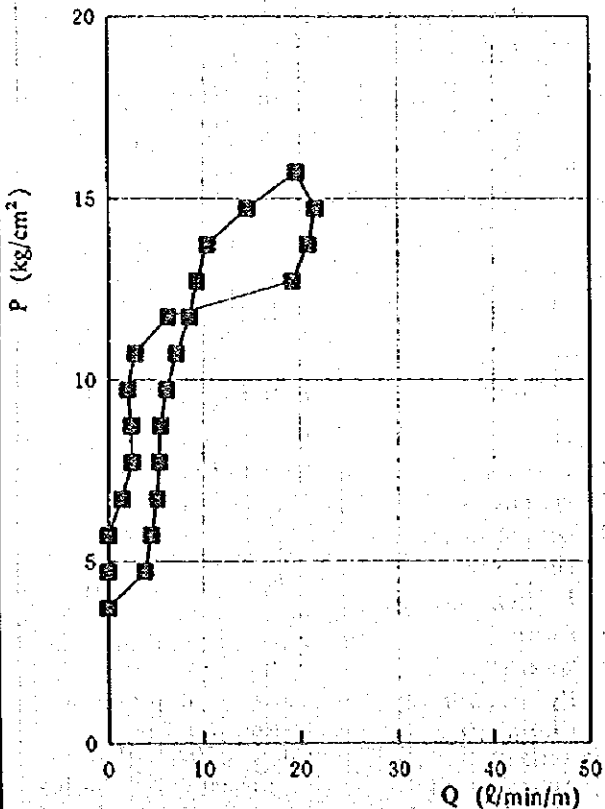
Los Llanos

PROJECT HOLE No. PHLL3SP

LOCATION Dam Site DEPTH OF HOLE 80.00 m TEST DATE _____
 ELEVATION 493.922 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 461,004.527; 388,113.049 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL vertical LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 36.30 m TO 37.80 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	36.30	0.00	3.73	5	0	0.00	0.00			
1	36.30	1.00	4.73	5	0	0.00	0.00			
1	36.30	2.00	5.73	5	0	0.00	0.00			
1	36.30	3.00	6.73	5	10.5	2.10	1.40			
1	36.30	4.00	7.73	5	18.8	3.76	2.51			
1	36.30	5.00	8.73	5	17.9	3.58	2.39			
1	36.30	6.00	9.73	5	15.3	3.06	2.04			
1	36.30	7.00	10.73	5	20.8	4.16	2.77			
1	36.30	8.00	11.73	5	47	9.40	6.27			
1	36.30	9.00	12.73	5	144	28.80	19.20			
1	36.30	10.00	13.73	5	156	31.20	20.80			
1	36.30	11.00	14.73	5	162	32.40	21.60			
1	36.30	12.00	15.73	10	295	29.50	19.67			
1	36.30	11.00	14.73	5	109	21.80	14.53			
1	36.30	10.00	13.73	5	78	15.60	10.40			
1	36.30	9.00	12.73	5	70	14.00	9.33			
1	36.30	8.00	11.73	5	64	12.80	8.53			
1	36.30	7.00	10.73	5	54	10.80	7.20			
1	36.30	6.00	9.73	5	46	9.20	6.13			
1	36.30	5.00	8.73	5	41	8.20	5.47			
1	36.30	4.00	7.73	5	40	8.00	5.33			
1	36.30	3.00	6.73	5	38.5	7.70	5.13			
1	36.30	2.00	5.73	5	34	6.80	4.53			
1	36.30	1.00	4.73	5	29	5.80	3.87			
1	36.30	0.00	3.73	5	0	0.00	0.00			



- ① : Pump
 ② : Flow meter
 ③ : Pressure gauge
 ④ : Ground surface
 ⑤ : Drill hole
 ⑥ : Injection pipe
 ⑦ : Packer
 ⑧ : Water table
 ⑨ : Hydrostatic head
 ⑩ : Length of test section
 ⑪ : Diameter of hole
- Po : Gauge pressure
 H₁ : Height of Pressure gauge
 H₂ : Depth of Ground water (Saturated Strata)
 P : Effective pressure
 $P = P_0 + H(m)/10$, $H = H_1 + H_2$
 t : Injected time
 Qt : Water volume during time in "t"
 Qo : Water volume per one min.
 Lu : Lugeon value in l/min/m/10kg/cm²
 K : Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (8/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. **PHLL3SP**

LOCATION **Dam Site** DEPTH OF HOLE **80.00** m TEST DATE _____

ELEVATION **493.922** m DIAMETER OF HOLE _____ cm TESTED BY **ICE**

COORDINATE **461,004.527; 388,113.049** DRILLED DEPTH _____ m DRILLED BY **ICE**

ANGLE FROM HORIZONTAL **Vertical** LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE.T. _____ m AFTER.T. _____ m

TEST SECTION FROM **46.50** m TO **48.00** m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	46.50	0.00	4.75	5	0	0.00	0.00		
	1	46.50	1.00	5.75	5	6.4	1.28	0.85		
	1	46.50	2.00	6.75	5	14.6	2.92	1.95		
	1	46.50	3.00	7.75	5	16.1	3.22	2.15		
	1	46.50	4.00	8.75	5	16.1	3.22	2.15		
	1	46.50	5.00	9.75	5	17.1	3.42	2.28		
	1	46.50	6.00	10.75	6	16.5	3.30	2.20		
	1	46.50	7.00	11.75	5	19.9	3.98	2.65		
	1	46.50	8.00	12.75	5	20.9	4.18	2.79		
	1	46.50	9.00	13.75	5	20.3	4.06	2.71		
	1	46.50	10.00	14.75	5	19	3.80	2.53		
	1	46.50	11.00	15.75	5	19.2	3.84	2.56		
	1	46.50	12.00	16.75	10	35.5	3.55	2.37		
	1	46.50	11.00	15.75	5	17.7	3.54	2.36		
	1	46.50	10.00	14.75	5	14.6	2.92	1.95		
	1	46.50	9.00	13.75	5	13.1	2.62	1.75		
	1	46.50	8.00	12.75	5	11.8	2.36	1.57		
	1	46.50	7.00	11.75	5	11.4	2.28	1.52		
	1	46.50	6.00	10.75	5	16.7	3.34	2.23		
	1	46.50	5.00	9.75	5	12.4	2.48	1.65		
	1	46.50	4.00	8.75	5	10.7	2.14	1.43		
	1	46.50	3.00	7.75	5	10.5	2.10	1.40		
	1	46.50	2.00	6.75	5	11.1	2.22	1.48		
	1	46.50	1.00	5.75	5	10.3	2.06	1.37		
	1	46.50	0.00	4.75	5	0	0.00	0.00		

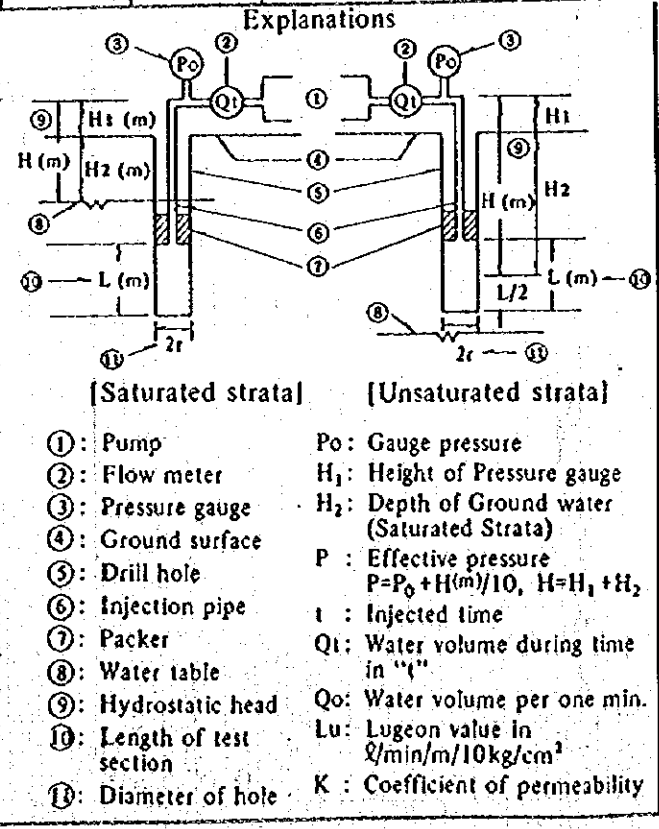
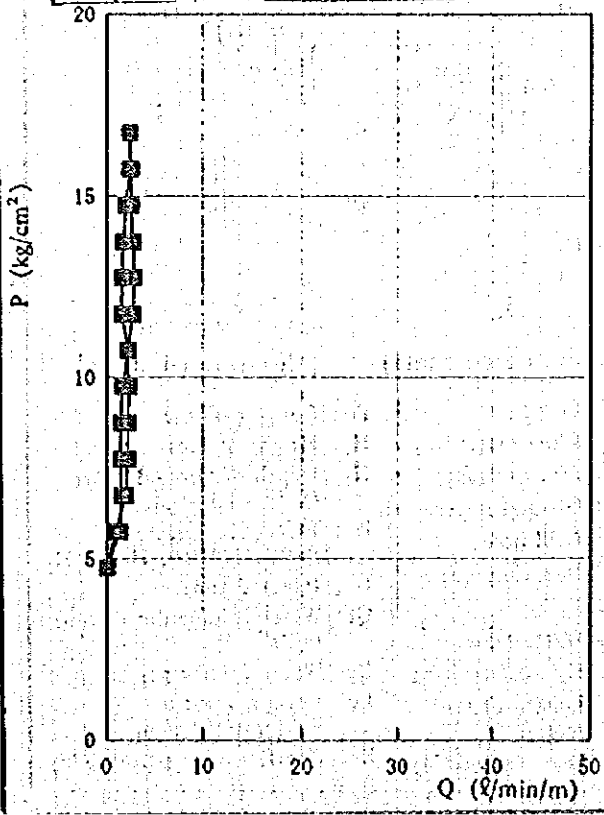


Table A-3-2 Data of Permeability Test and P-Q Curve (9/19)

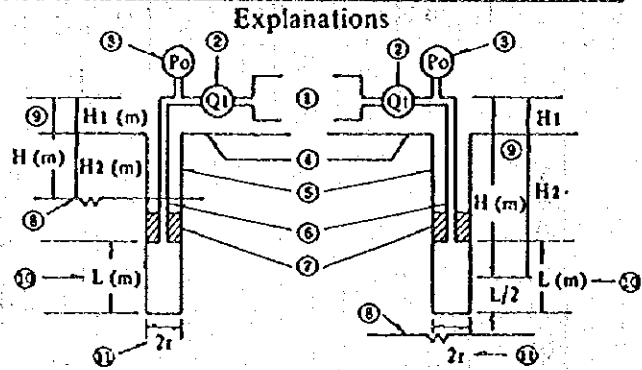
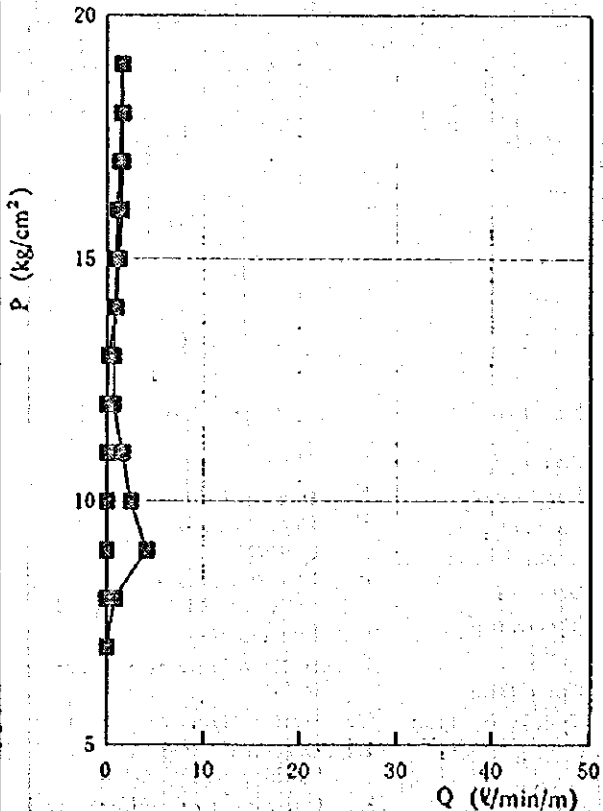
PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. PHLL3SP

LOCATION Dam Site E DEPTH OF HOLE 80.00 m TEST DATE _____
 ELEVATION 493.922 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 461,004.527; 388,113.049 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL Vertical LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 68.90 m TO 70.40 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	68.90	0.00	6.99	5	0	0.00	0.00		
	1	68.90	1.00	7.99	5	6.5	1.30	0.87		
	1	68.90	2.00	8.99	5	32	6.40	4.27		
	1	68.90	3.00	9.99	5	19.5	3.90	2.60		
	1	68.90	4.00	10.99	5	12.5	2.50	1.67		
	1	68.90	5.00	11.99	5	5.6	1.12	0.75		
	1	68.90	6.00	12.99	5	5.5	1.10	0.73		
	1	68.90	7.00	13.99	5	6.9	1.38	0.92		
	1	68.90	8.00	14.99	5	7.5	1.50	1.00		
	1	68.90	9.00	15.99	5	8.7	1.74	1.16		
	1	68.90	10.00	16.99	5	10	2.00	1.33		
	1	68.90	11.00	17.99	5	11.8	2.36	1.57		
	1	68.90	12.00	18.99	10	25.3	2.53	1.69		
	1	68.90	11.00	17.99	5	13	2.60	1.73		
	1	68.90	10.00	16.99	5	12.3	2.46	1.64		
	1	68.90	9.00	15.99	5	11.8	2.36	1.57		
	1	68.90	8.00	14.99	5	9.9	1.98	1.32		
	1	68.90	7.00	13.99	5	7.5	1.50	1.00		
	1	68.90	6.00	12.99	5	1.7	0.34	0.23		
	1	68.90	5.00	11.99	5	0	0.00	0.00		
	1	68.90	4.00	10.99	5	0	0.00	0.00		
	1	68.90	3.00	9.99	5	0	0.00	0.00		
	1	68.90	2.00	8.99	5	0	0.00	0.00		
	1	68.90	1.00	7.99	5	0	0.00	0.00		
	1	68.90	0.00	6.99	5	0	0.00	0.00		



- Explanations**
- ①: Pump
 - ②: Flow meter
 - ③: Pressure gauge
 - ④: Ground surface
 - ⑤: Drill hole
 - ⑥: Injection pipe
 - ⑦: Packer
 - ⑧: Water table
 - ⑨: Hydrostatic head
 - ⑩: Length of test section
 - ⑪: Diameter of hole
- Po: Gauge pressure
 - H₁: Height of Pressure gauge
 - H₂: Depth of Ground water (Saturated Strata)
 - P: Effective pressure
P = P₀ + H(m)/10, H = H₁ + H₂
 - t: Injected time
 - Qt: Water volume during time in "t"
 - Qo: Water volume per one min.
 - Lu: Lugeon value in l/min/m/10kg/cm²
 - K: Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (10/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. **PHLL4SP SP**

LOCATION Dam Site E DEPTH OF HOLE 60.00 m TEST DATE _____

ELEVATION 453.755 m DIAMETER OF HOLE _____ cm TESTED BY ICE

COORDINATE 481,071.205; 388,061.939 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL 70 ° LEVEL OF WATER TABLE _____ m CHECKED BY _____

BEARING OF ANGLE HOLE 300 BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 11.90 m TO 13.40 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	11.90	0.00	1.29	5	0	0.00	0.00		
	1	11.90	1.00	2.29	5	208	41.60	27.73		
	1	11.90	2.00	3.29	5	200	40.00	26.67		
	1	11.90	3.00	4.29	5	184	36.80	24.53		
	1	11.90	4.00	5.29	5	196	39.20	26.13		
	1	11.90	5.00	6.29	5	219	43.80	29.20		
	1	11.90	6.00	7.29	5	226	45.20	30.13		
	1	11.90	7.00	8.29	5	254	50.80	33.87		
	1	11.90	8.00	9.29	5	263	52.60	35.07		
	1	11.90	9.00	10.29	5	250	50.00	33.33		
	1	11.90	10.00	11.29	5	213	42.60	28.40		
	1	11.90	11.00	12.29	5	301	60.20	40.13		
	1	11.90	12.00	13.29	10	349	34.90	23.27		

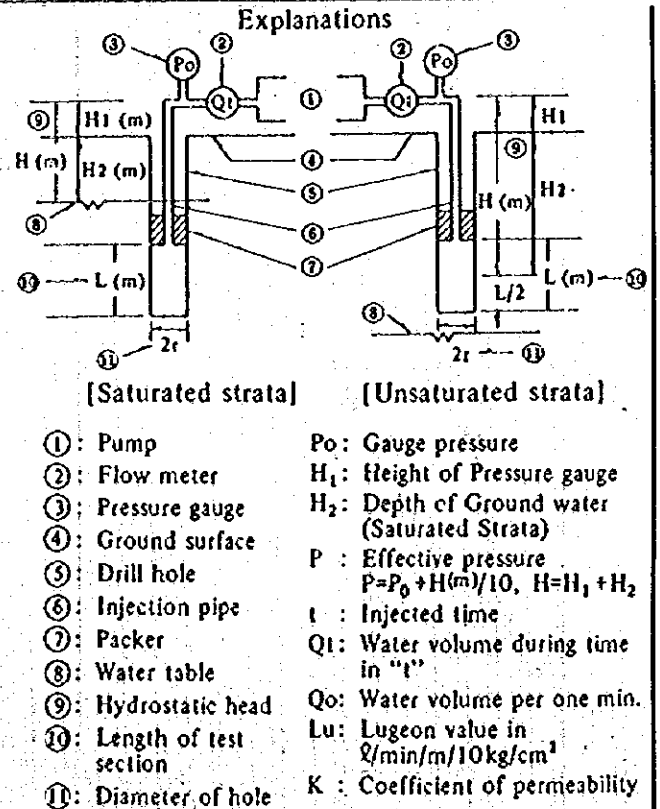
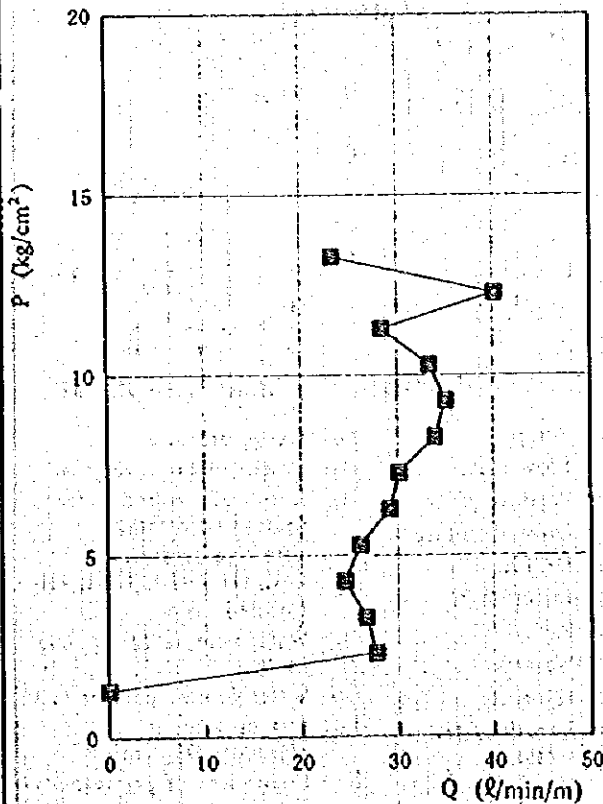
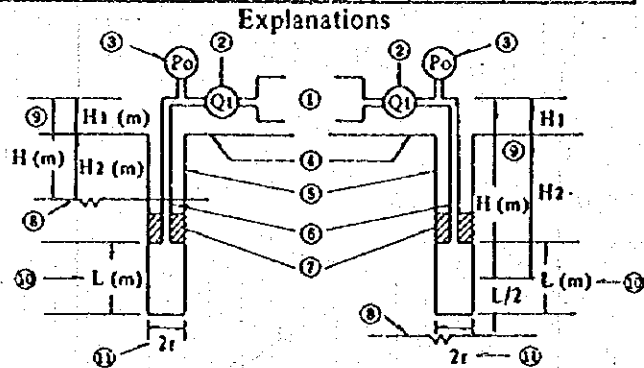
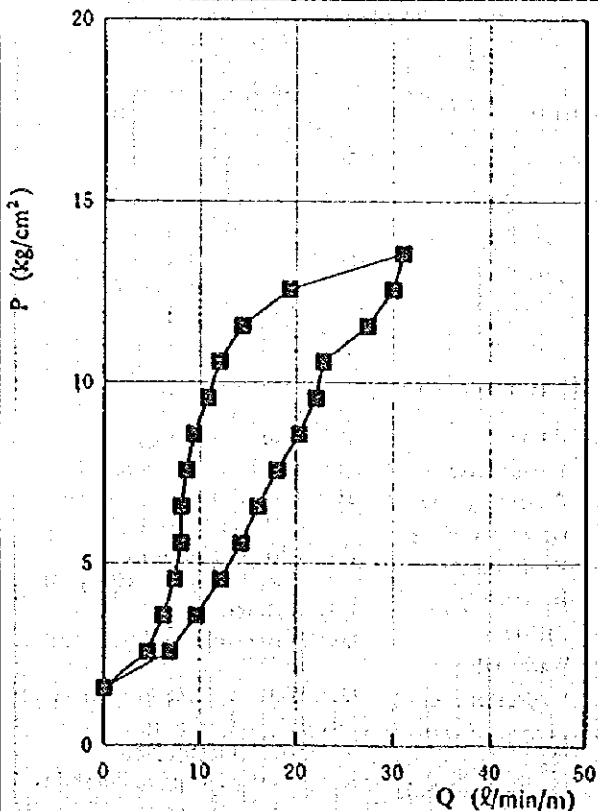


Table A-3-2 Data of Permeability Test and P-Q Curve (11/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)
 Los Llanos PROJECT HOLE No. PHLL4SP SP

LOCATION Dam Site E DEPTH OF HOLE 60.00 m TEST DATE _____
 ELEVATION 453.755 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 461,071.205; 388,061.939 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL 70 ° LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE 300 BEFORE T. _____ m AFTER T. _____ m
 TEST SECTION FROM 14.70 m TO 16.20 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	14.70	14.70	0.00	1.57	5	0	0.00	0.00		
1	14.70	14.70	1.00	2.57	5	34	6.80	4.53		
1	14.70	14.70	2.00	3.57	5	46	9.20	6.13		
1	14.70	14.70	3.00	4.57	5	55	11.00	7.33		
1	14.70	14.70	4.00	5.57	5	60	12.00	8.00		
1	14.70	14.70	5.00	6.57	5	60	12.00	8.00		
1	14.70	14.70	6.00	7.57	5	64	12.80	8.53		
1	14.70	14.70	7.00	8.57	5	70	14.00	9.33		
1	14.70	14.70	8.00	9.57	5	81	16.20	10.80		
1	14.70	14.70	9.00	10.57	5	90	18.00	12.00		
1	14.70	14.70	10.00	11.57	5	108	21.60	14.40		
1	14.70	14.70	11.00	12.57	5	145	29.00	19.33		
1	14.70	14.70	12.00	13.57	10	466	46.60	31.07		
1	14.70	14.70	11.00	12.57	5	225	45.00	30.00		
1	14.70	14.70	10.00	11.57	5	205	41.00	27.33		
1	14.70	14.70	9.00	10.57	5	171	34.20	22.80		
1	14.70	14.70	8.00	9.57	5	165	33.00	22.00		
1	14.70	14.70	7.00	8.57	5	152	30.40	20.27		
1	14.70	14.70	6.00	7.57	5	135	27.00	18.00		
1	14.70	14.70	5.00	6.57	5	120	24.00	16.00		
1	14.70	14.70	4.00	5.57	5	107	21.40	14.27		
1	14.70	14.70	3.00	4.57	5	91	18.20	12.13		
1	14.70	14.70	2.00	3.57	5	72	14.40	9.60		
1	14.70	14.70	1.00	2.57	5	51	10.20	6.80		
1	14.70	14.70	0.00	1.57	5	0	0.00	0.00		



- Explanations**
- ① : Pump
 - ② : Flow meter
 - ③ : Pressure gauge
 - ④ : Ground surface
 - ⑤ : Drill hole
 - ⑥ : Injection pipe
 - ⑦ : Packer
 - ⑧ : Water table
 - ⑨ : Hydrostatic head
 - ⑩ : Length of test section
 - ⑪ : Diameter of hole
 - Po : Gauge pressure
 - H₁ : Height of Pressure gauge
 - H₂ : Depth of Ground water (Saturated Strata)
 - P : Effective pressure
 - P = P₀ + H(m)/10, H = H₁ + H₂
 - t : Injected time
 - Qt : Water volume during time in "t"
 - Qo : Water volume per one min.
 - Lu : Lugeon value in l/min/m/10kg/cm²
 - K : Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (12/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. **PHLL4SP SP**

LOCATION Dam Site E DEPTH OF HOLE 60.00 m TEST DATE _____

ELEVATION 453.755 m DIAMETER OF HOLE _____ cm TESTED BY ICE

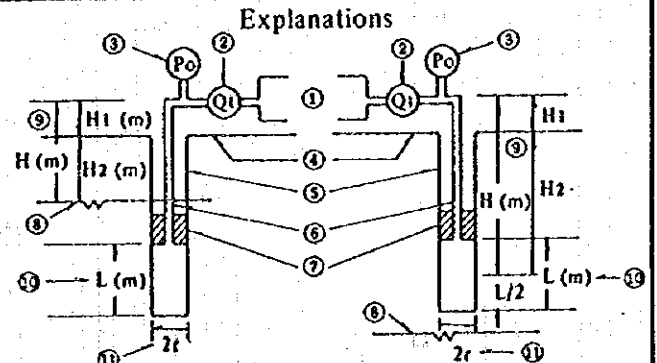
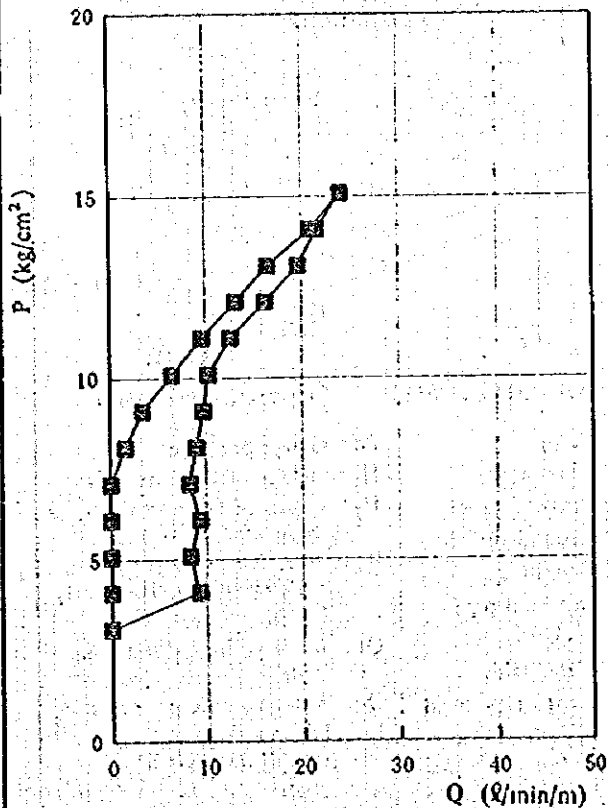
COORDINATE 461,071.205; 388,061.939 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL 70 ° LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE 300 BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 29.95 m TO 31.45 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	29.95	0.00	3.10	5	0	0.00	0.00		
	1	29.95	1.00	4.10	5	69	13.80	9.20		
	1	29.95	2.00	5.10	5	62	12.40	8.27		
	1	29.95	3.00	6.10	5	70	14.00	9.33		
	1	29.95	4.00	7.10	5	62	12.40	8.27		
	1	29.95	5.00	8.10	5	67	13.40	8.93		
	1	29.95	6.00	9.10	5	73	14.60	9.73		
	1	29.95	7.00	10.10	5	77	15.40	10.27		
	1	29.95	8.00	11.10	5	94	18.80	12.53		
	1	29.95	9.00	12.10	5	121	24.20	16.13		
	1	29.95	10.00	13.10	5	147	29.40	19.60		
	1	29.95	11.00	14.10	5	162	32.40	21.60		
	1	29.95	12.00	15.10	10	362	36.20	24.13		
	1	29.95	11.00	14.10	5	156	31.20	20.80		
	1	29.95	10.00	13.10	5	123	24.60	16.40		
	1	29.95	9.00	12.10	5	98	19.60	13.07		
	1	29.95	8.00	11.10	5	72	14.40	9.60		
	1	29.95	7.00	10.10	5	49	9.80	6.53		
	1	29.95	6.00	9.10	5	26	5.20	3.47		
	1	29.95	5.00	8.10	5	12	2.40	1.60		
	1	29.95	4.00	7.10	5	0	0.00	0.00		
	1	29.95	3.00	6.10	5	0	0.00	0.00		
	1	29.95	2.00	5.10	5	0	0.00	0.00		
	1	29.95	1.00	4.10	5	0	0.00	0.00		
	1	29.95	0.00	3.10	5	0	0.00	0.00		



- Explanations**
- ①: Pump
 - ②: Flow meter
 - ③: Pressure gauge
 - ④: Ground surface
 - ⑤: Drill hole
 - ⑥: Injection pipe
 - ⑦: Packer
 - ⑧: Water table
 - ⑨: Hydrostatic head
 - ⑩: Length of test section
 - ⑪: Diameter of hole
- P_0 : Gauge pressure
 H_1 : Height of Pressure gauge
 H_2 : Depth of Ground water (Saturated Strata)
 P : Effective pressure
 $P = P_0 + H(m)/10$, $H = H_1 + H_2$
 t : Injected time
 Q_t : Water volume during time in "t"
 Q_0 : Water volume per one min.
 L_u : Lugeon value in $Q/min/m/10kg/cm^2$
 K : Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (13/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos

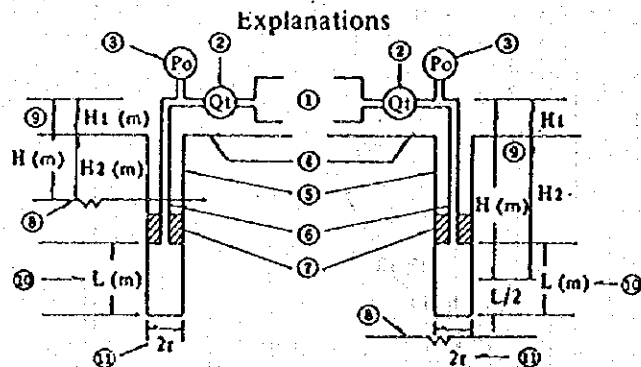
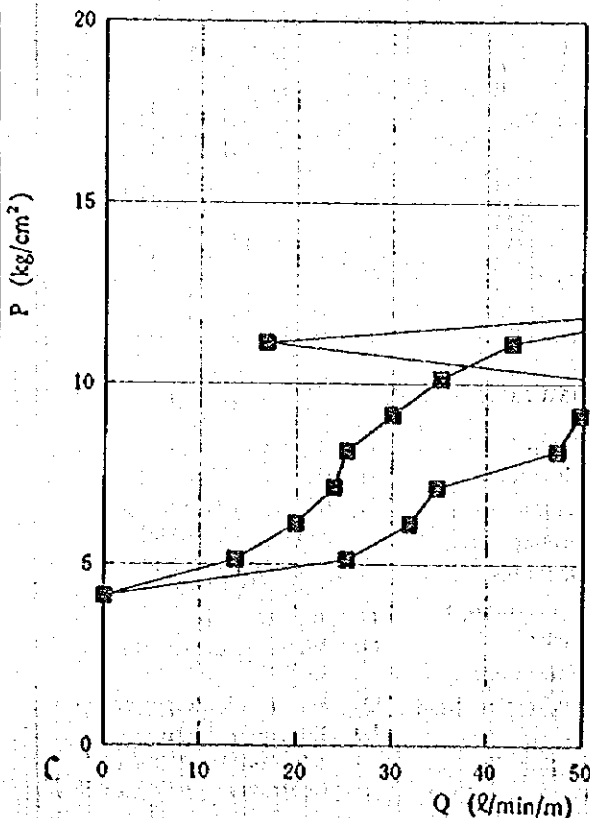
PROJECT

HOLE No.

PHLL4SP

LOCATION	Dam Site E	DEPTH OF HOLE	60.00 m	TEST DATE	
ELEVATION	453.755 m	DIAMETER OF HOLE	cm	TESTED BY	ICE
COORDINATE	461,071.205; 388,061.939	DRILLED DEPTH	m	DRILLED BY	ICE
ANGLE FROM HORIZONTAL	70°	LEVEL OF WATER TABLE		CHECKED BY	
BEARING OF ANGLE HOLE	300	BEFORE T.	m	AFTER T.	m
TEST SECTION	FROM 40.30 m TO 41.80 m				

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	40.30	0.00	4.13	5	5	0	0.00	0.00		
1	40.30	1.00	5.13	5	5	189	37.80	25.20		
1	40.30	2.00	6.13	5	5	239	47.80	31.87		
1	40.30	3.00	7.13	5	5	261	52.20	34.80		
1	40.30	4.00	8.13	5	5	355	71.00	47.33		
1	40.30	5.00	9.13	5	5	372	74.40	49.60		
1	40.30	6.00	10.13	5	5	385	77.00	51.33		
1	40.30	7.00	11.13	5	5	126	25.20	16.80		
1	40.30	8.00	12.13	10	10	937	93.70	62.47		
1	40.30	7.00	11.13	5	5	320	64.00	42.67		
1	40.30	6.00	10.13	5	5	264	52.80	35.20		
1	40.30	5.00	9.13	5	5	225	45.00	30.00		
1	40.30	4.00	8.13	5	5	189	37.80	25.20		
1	40.30	3.00	7.13	5	5	179	35.80	23.87		
1	40.30	2.00	6.13	5	5	149	29.80	19.87		
1	40.30	1.00	5.13	5	5	102	20.40	13.60		
1	40.30	0.00	4.13	5	5	0	0.00	0.00		



[Saturated strata]

[Unsaturated strata]

- ① : Pump
- ② : Flow meter
- ③ : Pressure gauge
- ④ : Ground surface
- ⑤ : Drill hole
- ⑥ : Injection pipe
- ⑦ : Packer
- ⑧ : Water table
- ⑨ : Hydrostatic head
- ⑩ : Length of test section
- ⑪ : Diameter of hole
- Po : Gauge pressure
- H₁ : Height of Pressure gauge
- H₂ : Depth of Ground water (Saturated Strata)
- P : Effective pressure
P = P₀ + H(m)/10, H = H₁ + H₂
- t : Injected time
- Qt : Water volume during time in "t"
- Qo : Water volume per one min.
- Lu : Lugeon value in l/min/m/10kg/cm²
- K : Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (14/19)

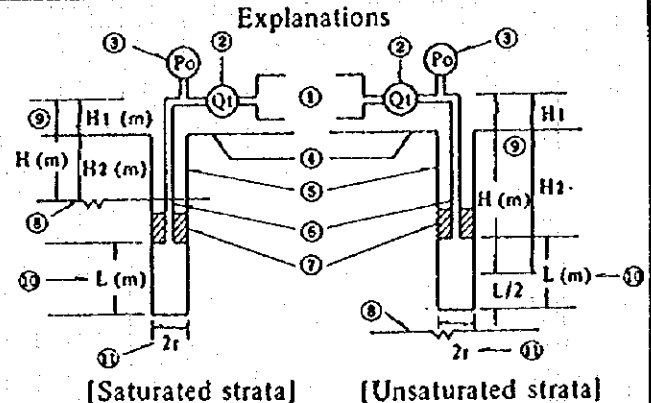
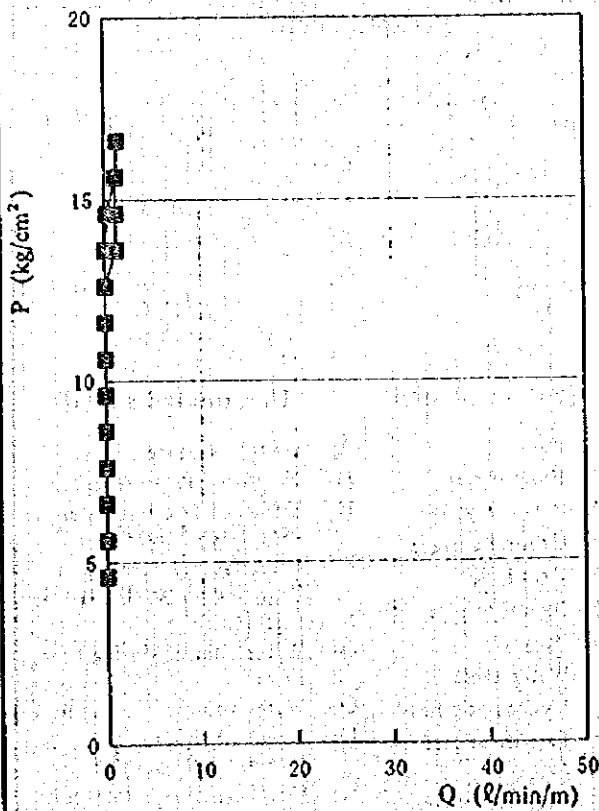
PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. PHLL4SP

LOCATION Dam Site DEPTH OF HOLE 60.00 m TEST DATE _____
 ELEVATION 453.755 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 461,071.205; 388,061.939 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL 70 ° LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE 300 BEFORE T _____ m AFTER T _____ m

TEST SECTION FROM 45.20 m TO 46.70 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	45.20	0.00	4.62	5	0	0.00	0.00		
	1	45.20	1.00	5.62	5	0	0.00	0.00		
	1	45.20	2.00	6.62	5	0	0.00	0.00		
	1	45.20	3.00	7.62	5	0	0.00	0.00		
	1	45.20	4.00	8.62	5	0	0.00	0.00		
	1	45.20	5.00	9.62	5	0	0.00	0.00		
	1	45.20	6.00	10.62	5	0	0.00	0.00		
	1	45.20	7.00	11.62	5	0	0.00	0.00		
	1	45.20	8.00	12.62	5	0	0.00	0.00		
	1	45.20	9.00	13.62	5	9	1.80	1.20		
	1	45.20	10.00	14.62	5	9	1.80	1.20		
	1	45.20	11.00	15.62	5	9	1.80	1.20		
	1	45.20	12.00	16.62	10	20	2.00	1.33		
	1	45.20	11.00	15.62	5	9	1.80	1.20		
	1	45.20	10.00	14.62	5	2	0.40	0.27		
	1	45.20	9.00	13.62	5	0	0.00	0.00		
	1	45.20	8.00	12.62	5	0	0.00	0.00		
	1	45.20	7.00	11.62	5	0	0.00	0.00		
	1	45.20	6.00	10.62	5	0	0.00	0.00		
	1	45.20	5.00	9.62	5	0	0.00	0.00		
	1	45.20	4.00	8.62	5	0	0.00	0.00		
	1	45.20	3.00	7.62	5	0	0.00	0.00		
	1	45.20	2.00	6.62	5	0	0.00	0.00		
	1	45.20	1.00	5.62	5	0	0.00	0.00		
	1	45.20	0.00	4.62	5	0	0.00	0.00		



- ①: Pump
- ②: Flow meter
- ③: Pressure gauge
- ④: Ground surface
- ⑤: Drill hole
- ⑥: Injection pipe
- ⑦: Packer
- ⑧: Water table
- ⑨: Hydrostatic head
- ⑩: Length of test section
- Ⓧ: Diameter of hole
- Po: Gauge pressure
- H₁: Height of Pressure gauge
- H₂: Depth of Ground water (Saturated Strata)
- P: Effective pressure
P = P₀ + H(m)/10, H = H₁ + H₂
- t: Injected time
- Qt: Water volume during time in "t"
- Qo: Water volume per one min.
- Lu: Lugeon value in l/min/m/10kg/cm²
- K: Coefficient of permeability

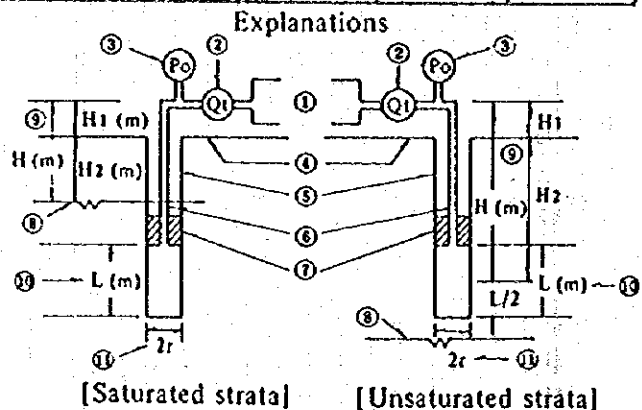
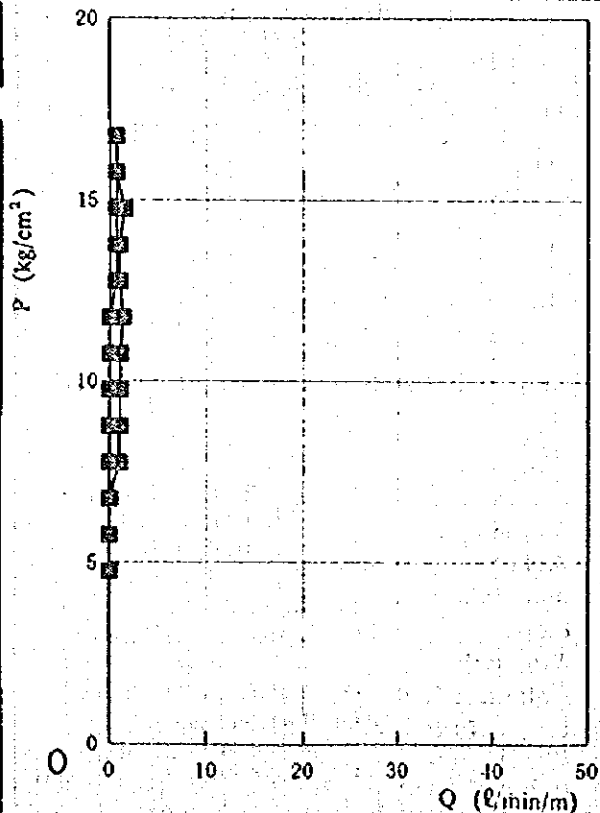
Table A-3-2 Data of Permeability Test and P-Q Curve (15/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. PHL4SP

LOCATION Dam Site E DEPTH OF HOLE 60.00 m TEST DATE _____
 ELEVATION 453.755 m DIAMETER OF HOLE _____ cm TESTED BY ICE
 COORDINATE 461,071.205; 388,061.939 DRILLED DEPTH _____ m DRILLED BY ICE
 ANGLE FROM HORIZONTAL 70 ° LEVEL OF WATER TABLE _____ CHECKED BY _____
 BEARING OF ANGLE HOLE 300 BEFORE T. _____ m AFTER T. _____ m
 TEST SECTION FROM 46.60 m TO 48.10 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	46.60	0.00	4.76	5	0	0.00	0.00			
1	46.60	1.00	5.78	5	0	0.00	0.00			
1	46.60	2.00	6.76	5	0	0.00	0.00			
1	46.60	3.00	7.76	5	7	1.40	0.93			
1	46.60	4.00	8.76	5	8	1.60	1.07			
1	46.60	5.00	9.76	5	8	1.60	1.07			
1	46.60	6.00	10.76	5	8	1.60	1.07			
1	46.60	7.00	11.76	5	10	2.00	1.33			
1	46.60	8.00	12.76	5	7	1.40	0.93			
1	46.60	9.00	13.76	5	7	1.40	0.93			
1	46.60	10.00	14.76	5	11	2.20	1.47			
1	46.60	11.00	15.76	5	5	1.00	0.67			
1	46.60	12.00	16.76	10	10	1.00	0.67			
1	46.60	11.00	15.76	5	5	1.00	0.67			
1	46.60	10.00	14.76	5	5	1.00	0.67			
1	46.60	9.00	13.76	5	5	1.00	0.67			
1	46.60	8.00	12.76	5	5	1.00	0.67			
1	46.60	7.00	11.76	5	0	0.00	0.00			
1	46.60	6.00	10.76	5	0	0.00	0.00			
1	46.60	5.00	9.76	5	0	0.00	0.00			
1	46.60	4.00	8.76	5	0	0.00	0.00			
1	46.60	3.00	7.76	5	0	0.00	0.00			
1	46.60	2.00	6.76	5	0	0.00	0.00			
1	46.60	1.00	5.76	5	0	0.00	0.00			
1	46.60	0.00	4.76	5	0	0.00	0.00			



- Explanations**
- ①: Pump
 - ②: Flow meter
 - ③: Pressure gauge
 - ④: Ground surface
 - ⑤: Drill hole
 - ⑥: Injection pipe
 - ⑦: Packer
 - ⑧: Water table
 - ⑨: Hydrostatic head
 - ⑩: Length of test section
 - Ⓜ: Diameter of hole
 - Po: Gauge pressure
 - H₁: Height of Pressure gauge
 - H₂: Depth of Ground water (Saturated Strata)
 - P: Effective pressure
P = P₀ + H(m)/10, H = H₁ + H₂
 - t: Injected time
 - Qt: Water volume during time in "t"
 - Qo: Water volume per one min.
 - Lu: Lugeon value in Q/min/m/10kg/cm²
 - K: Coefficient of permeability

Table A-3-2 Data of Permeability Test and P-Q Curve (16/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. PHLL9CM ✓

LOCATION Power Station Site DEPTH OF HOLE 31.50 m TEST DATE _____

ELEVATION 88.296 m DIAMETER OF HOLE _____ cm TESTED BY ICE

COORDINATE 454,949.261; 385,394.298 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL vertical LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 15.75 m TO 17.25 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	15.75	0.00	1.68				0.00		
	1	15.75	1.00	2.68				2.50		
	1	15.75	2.00	3.68				4.00		
	1	15.75	3.00	4.68				2.80		
	1	15.75	4.00	5.68				2.90		
	1	15.75	5.00	6.68				2.30		
	1	15.75	4.00	5.68				1.30		
	1	15.75	3.00	4.68				1.00		
	1	15.75	2.00	3.68				0.70		
	1	15.75	1.00	2.68				1.50		
	1	15.75	0.00	1.68				0.00		

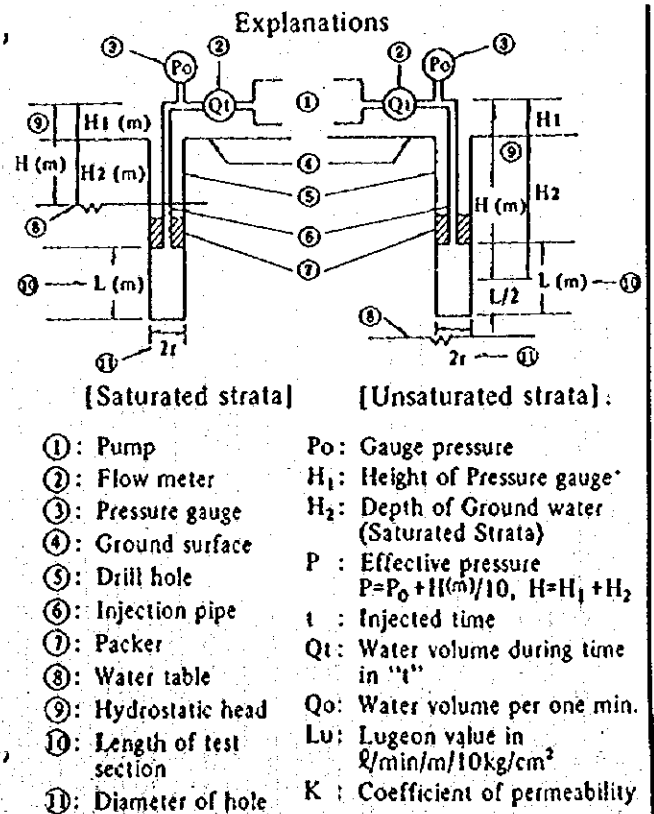
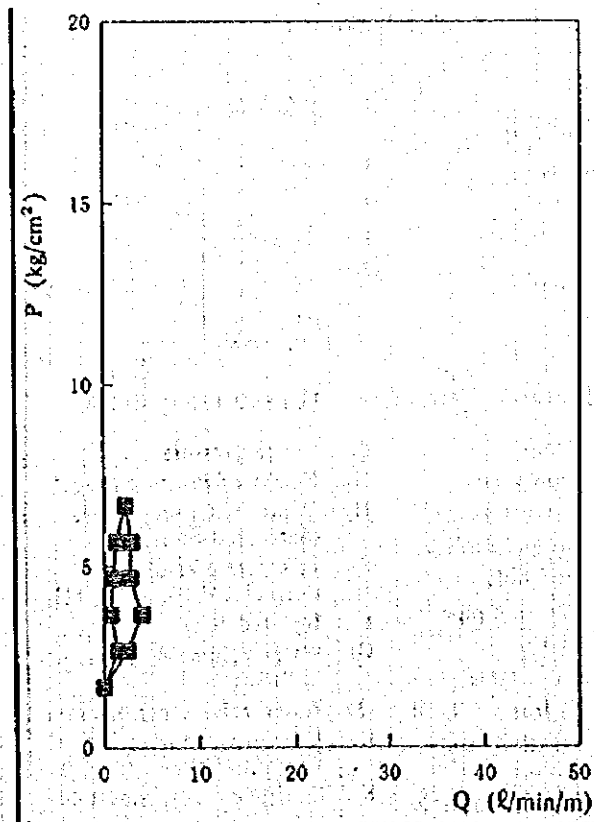


Table A-3-2 Data of Permeability Test and P-Q Curve (17/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. PHLL9CM

LOCATION	Power Station Site	DEPTH OF HOLE	31.50 m	TEST DATE	
ELEVATION	88.296 m	DIAMETER OF HOLE	cm	TESTED BY	ICE
COORDINATE	454,949.261; 385,394.296	DRILLED DEPTH	m	DRILLED BY	ICE
ANGLE FROM HORIZONTAL	Vertical	LEVEL OF WATER TABLE		CHECKED BY	
BEARING OF ANGLE HOLE		BEFORE T.	m	AFTER T.	m

TEST SECTION FROM 16.50 m TO 18.00 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	16.50	0.00	1.75				0.00		
	1	16.50	1.00	2.75				0.00		
	1	16.50	2.00	3.75				0.00		
	1	16.50	3.00	4.75				0.00		
	1	16.50	4.00	5.75				0.00		
	1	16.50	5.00	6.75				0.00		
	1	16.50	6.00	7.75				0.00		
	1	16.50	7.00	8.75				0.00		
	1	16.50	8.00	9.75				47.67		
	1	16.50	6.00	7.75				28.00		
	1	16.50	5.00	6.75				0.00		
	1	16.50	4.00	5.75				0.00		
	1	16.50	3.00	4.75				0.00		
	1	16.50	2.00	3.75				2.67		
	1	16.50	1.00	2.75				0.00		
	1	16.50	0.00	1.75				16.00		

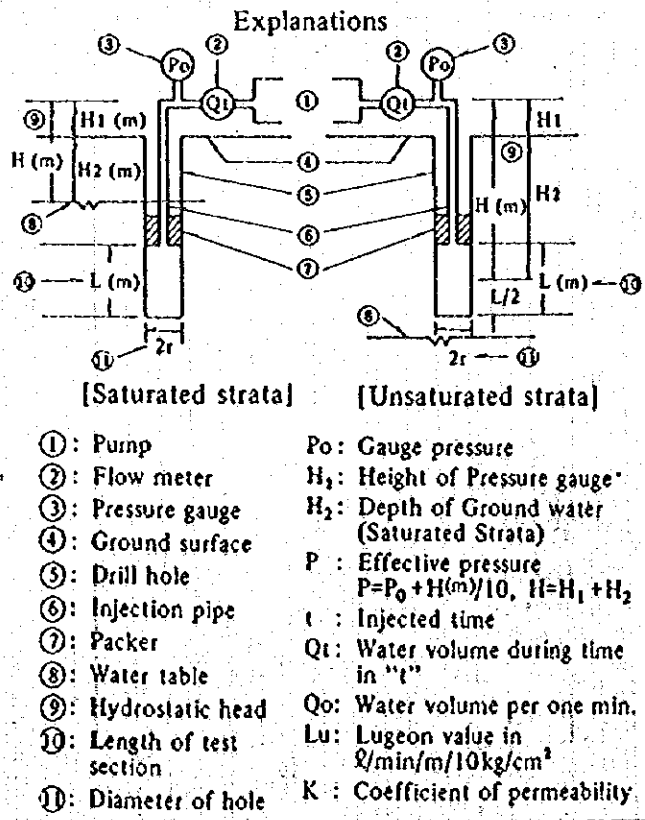
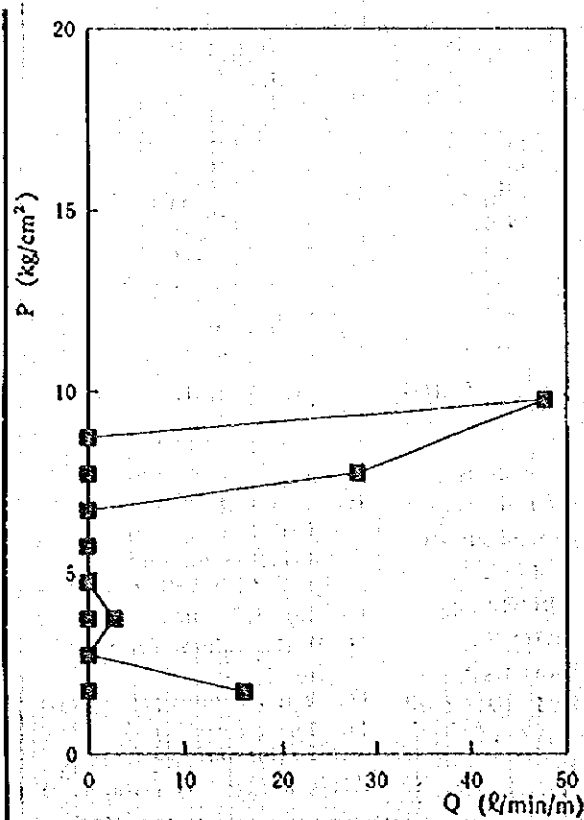


Table A-3-2 Data of Permeability Test and P-Q Curve (18/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. PHLL14CM

LOCATION Power Station Site DEPTH OF HOLE 34.15 m TEST DATE _____

ELEVATION 103.851 m DIAMETER OF HOLE _____ cm TESTED BY ICE

COORDINATE 455,199.831; 385,541.461 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL Vertical LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 12.15 m TO 13.65 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
1	12.15	0.00	1.32					0.00		
1	12.15	1.00	2.32					0.00		
1	12.15	2.00	3.32					0.00		
1	12.15	3.00	4.32					0.00		
1	12.15	4.00	5.32					1.00		
1	12.15	5.00	6.32					1.57		
1	12.15	6.00	7.32					1.50		
1	12.15	7.00	8.32					1.57		
1	12.15	8.00	9.32					1.80		
1	12.15	9.00	10.32					2.40		
1	12.15	10.00	11.32					3.30		
1	12.15	9.00	10.32					2.80		
1	12.15	8.00	9.32					2.10		
1	12.15	7.00	8.32					2.00		
1	12.15	6.00	7.32					1.80		
1	12.15	5.00	6.32					1.27		
1	12.15	4.00	5.32					0.53		
1	12.15	3.00	4.32					0.00		
1	12.15	2.00	3.32					0.00		
1	12.15	1.00	2.32					0.00		
1	12.15	0.00	1.32					0.00		

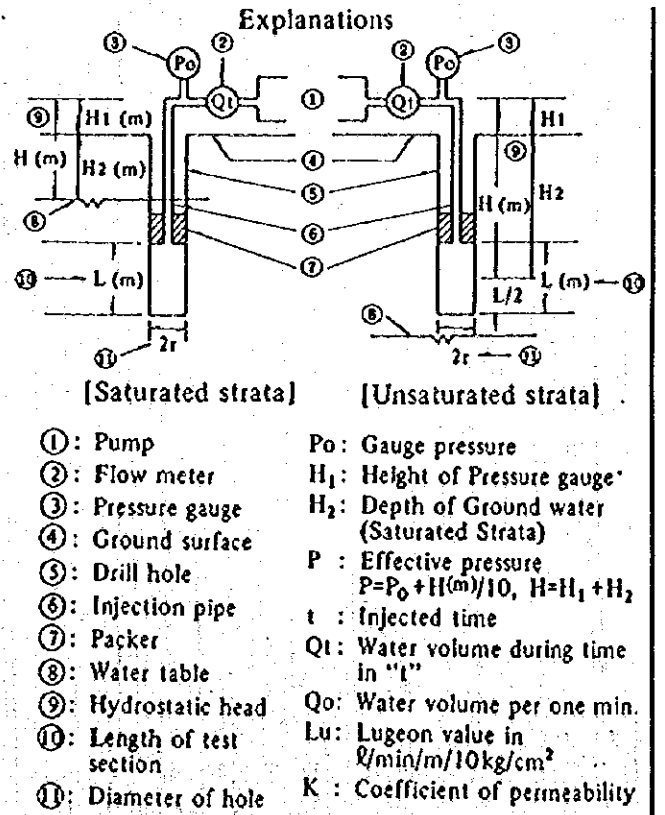
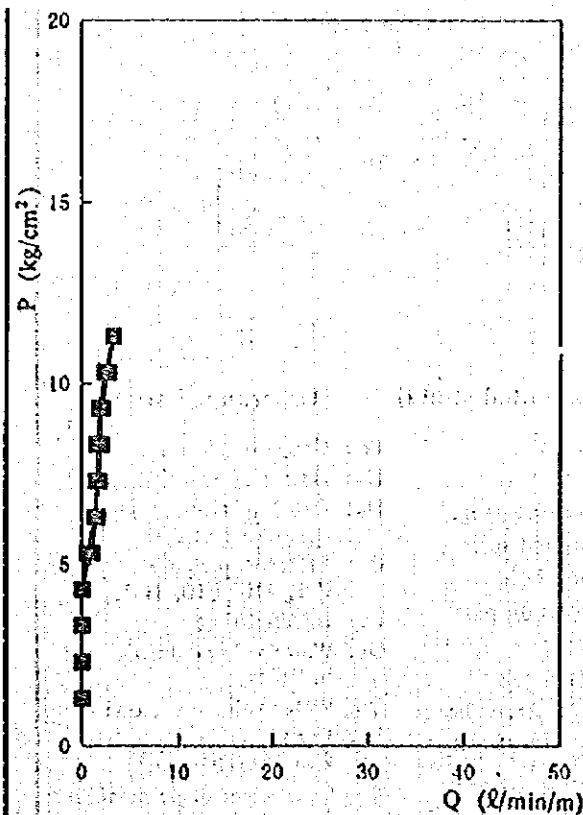


Table A-3-2 Data of Permeability Test and P-Q Curve (19/19)

PERMEABILITY TEST IN DRILL HOLE (SHEET OF)

Los Llanos PROJECT HOLE No. **PHLL14CM**

LOCATION Power Station Site DEPTH OF HOLE 34.15 m TEST DATE _____

ELEVATION 103.851 m DIAMETER OF HOLE _____ cm TESTED BY ICE

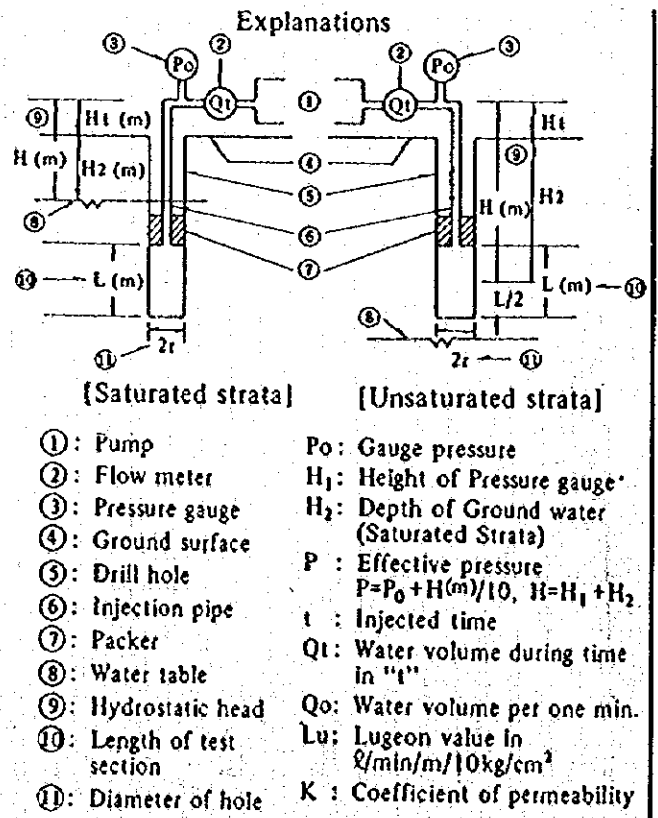
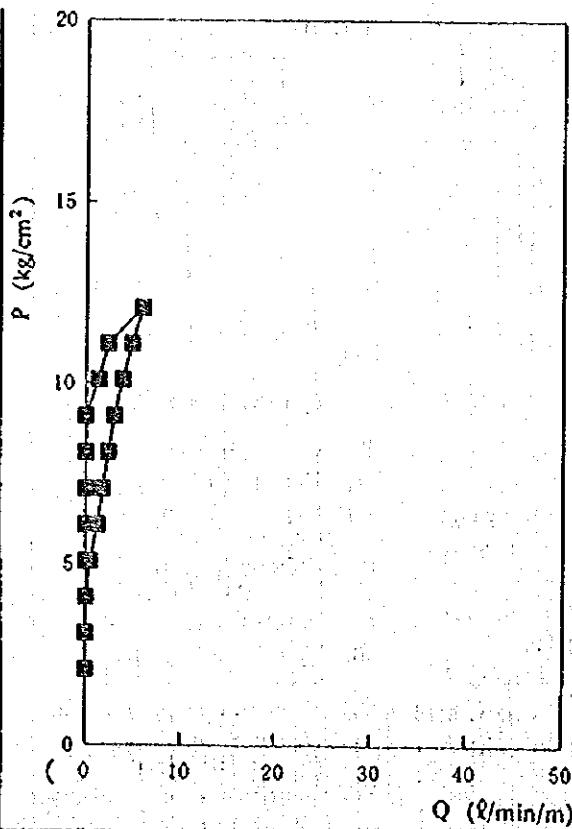
COORDINATE 455,199.831; 385,541.461 DRILLED DEPTH _____ m DRILLED BY ICE

ANGLE FROM HORIZONTAL Vertical LEVEL OF WATER TABLE _____ CHECKED BY _____

BEARING OF ANGLE HOLE _____ BEFORE T. _____ m AFTER T. _____ m

TEST SECTION FROM 19.85 m TO 21.35 m

L (m)	H1 (m)	H2 (m)	P0 (kg/cm ²)	P (kg/cm ²)	t (min)	Qt (l)	Q0 (l/min)	Q (l/min/m)	Lu (Lugeon)	K (cm/sec)
	1	19.85	0.00	2.09				0.00		
	1	19.85	1.00	3.09				0.00		
	1	19.85	2.00	4.09				0.00		
	1	19.85	3.00	5.09				0.00		
	1	19.85	4.00	6.09				0.00		
	1	19.85	5.00	7.09				0.00		
	1	19.85	6.00	8.09				0.00		
	1	19.85	7.00	9.09				0.00		
	1	19.85	8.00	10.09				1.33		
	1	19.85	9.00	11.09				2.40		
	1	19.85	10.00	12.09				6.00		
	1	19.85	9.00	11.09				4.90		
	1	19.85	8.00	10.09				3.90		
	1	19.85	7.00	9.09				3.07		
	1	19.85	6.00	8.09				2.40		
	1	19.85	5.00	7.09				1.80		
	1	19.85	4.00	6.09				1.27		
	1	19.85	3.00	5.09				0.40		
	1	19.85	2.00	4.09				0.00		
	1	19.85	1.00	3.09				0.00		
	1	19.85	0.00	2.09				0.00		



A-4 Rock Foudation Test

- Fig.A-4-1 Deformation-Pressure Curve Adit No.1 TD15m Right
- Fig.A-4-2 Deformation-Pressure Curve Adit No.1 TD15m Left
- Fig.A-4-3 Deformation-Pressure Curve Adit No.1 TD28m Right
- Fig.A-4-4 Deformation-Pressure Curve Adit No.1 TD28m Left
- Fig.A-4-5 Deformation-Pressure Curve Pit No.2 Depth 9m
Pararell Right
- Fig.A-4-6 Deformation-Pressure Curve Pit No.2 Depth 9m
Pararell Left
- Fig.A-4-7 Deformation-Pressure Curve Pit No.2 Depth 9m
Perpendicular Right
- Fig.A-4-8 Deformation-Pressure Curve Pit No.2 Depth 9m
Perpendicular Left
- Fig.A-4-9 Deformation-Pressure Curve Deformation Test
PHLL2SP 8.7m
- Fig.A-4-10 Deformation-Pressure Curve Deformation Test
PHLL2SP 15.0m
- Fig.A-4-11 Deformation-Pressure Curve Deformation Test
PHLL2SP 15.5m
- Fig.A-4-12 Deformation-Pressure Curve Deformation Test
PHLL2SP 25.0m
- Fig.A-4-13 Deformation-Pressure Curve Deformation Test
PHLL2SP 25.4m
- Fig.A-4-14 Deformation-Pressure Curve Deformation Test
PHLL3SP 7.0m
- Fig.A-4-15 Deformation-Pressure Curve Deformation Test
PHLL3SP 8.0m
- Fig.A-4-16 Deformation-Pressure Curve Deformation Test
PHLL3SP 24.5m
- Fig.A-4-17 Deformation-Pressure Curve Deformation Test
PHLL3SP 25.0m
- Fig.A-4-18 Deformation-Pressure Curve Deformation Test
PHLL3SP 39.3m
- Fig.A-4-19 Deformation-Pressure Curve Deformation Test
PHLL3SP 39.8m
- Fig.A-4-20 Deformation-Pressure Curve Deformation Test

A-4 Rock Foudation Test

- Fig.A-4-1 Deformation-Pressure Curve Adit No.1 TD15m Right
- Fig.A-4-2 Deformation-Pressure Curve Adit No.1 TD15m Left
- Fig.A-4-3 Deformation-Pressure Curve Adit No.1 TD28m Right
- Fig.A-4-4 Deformation-Pressure Curve Adit No.1 TD28m Left
- Fig.A-4-5 Deformation-Pressure Curve Pit No.2 Depth 9m
Pararell Right
- Fig.A-4-6 Deformation-Pressure Curve Pit No.2 Depth 9m
Pararell Left
- Fig.A-4-7 Deformation-Pressure Curve Pit No.2 Depth 9m
Perpendiclar Right
- Fig.A-4-8 Deformation-Pressure Curve Pit No.2 Depth 9m
Perpendicular Left
- Fig.A-4-9 Deformation-Pressure Curve Deformation Test
PHLL2SP 8.7m
- Fig.A-4-10 Deformation-Pressure Curve Deformation Test
PHLL2SP 15.0m
- Fig.A-4-11 Deformation-Pressure Curve Deformation Test
PHLL2SP 15.5m
- Fig.A-4-12 Deformation-Pressure Curve Deformation Test
PHLL2SP 25.0m
- Fig.A-4-13 Deformation-Pressure Curve Deformation Test
PHLL2SP 25.4m
- Fig.A-4-14 Deformation-Pressure Curve Deformation Test
PHLL3SP 7.0m
- Fig.A-4-15 Deformation-Pressure Curve Deformation Test
PHLL3SP 8.0m
- Fig.A-4-16 Deformation-Pressure Curve Deformation Test
PHLL3SP 24.5m
- Fig.A-4-17 Deformation-Pressure Curve Deformation Test
PHLL3SP 25.0m
- Fig.A-4-18 Deformation-Pressure Curve Deformation Test
PHLL3SP 39.3m
- Fig.A-4-19 Deformation-Pressure Curve Deformation Test
PHLL3SP 39.8m
- Fig.A-4-20 Deformation-Pressure Curve Deformation Test

PHLL4SP 20.1m			
Fig.A-4-21	Deformation-Pressure	Curve	Deformation Test
PHLL4SP 29.7m			
Fig.A-4-22	Deformation-Pressure	Curve	Deformation Test
PHLL4SP 30.7m			
Fig.A-4-23	Deformation-Pressure	Curve	Deformation Test
PHLL4SP 40.0m			
Fig.A-4-24	Deformation-Pressure	Curve	Deformation Test
PHLL4SP 40.3m			
Fig.A-4-25	Deformation-Pressure	Curve	Deformation Test
PHLL4SP 49.8m			
Fig.A-4-26	Deformation-Pressure	Curve	Deformation Test
PHLL4SP 50.3m			
Fig.A-4-27	Deformation-Pressure	Curve	Deformation Test
PHLL16CM 3.4m			
Fig.A-4-28	Deformation-Pressure	Curve	Deformation Test
PHLL16CM 3.6m			
Fig.A-4-29	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 10.3m			
Fig.A-4-30	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 10.5m			
Fig.A-4-31	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 16.10m			
Fig.A-4-32	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 16.50m			
Fig.A-4-33	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 22.3m			
Fig.A-4-34	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 22.5m			
Fig.A-4-35	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 29.3m			
Fig.A-4-36	Deformation-Pressure	Curve	Deformation Test
PHLL18TP 29.5m			
Fig.A-4-37	Deformation-Pressure	Curve	Deformation Test
PHLL19CM 4.9m			
Fig.A-4-38	Deformation-Pressure	Curve	Deformation Test

PHLL4SP 20.1m			
Fig.A-4-21	Deformation-Pressure Curve	Deformation Test	
PHLL4SP 29.7m			
Fig.A-4-22	Deformation-Pressure Curve	Deformation Test	
PHLL4SP 30.7m			
Fig.A-4-23	Deformation-Pressure Curve	Deformation Test	
PHLL4SP 40.0m			
Fig.A-4-24	Deformation-Pressure Curve	Deformation Test	
PHLL4SP 40.3m			
Fig.A-4-25	Deformation-Pressure Curve	Deformation Test	
PHLL4SP 49.8m			
Fig.A-4-26	Deformation-Pressure Curve	Deformation Test	
PHLL4SP 50.3m			
Fig.A-4-27	Deformation-Pressure Curve	Deformation Test	
PHLL16CM 3.4m			
Fig.A-4-28	Deformation-Pressure Curve	Deformation Test	
PHLL16CM 3.6m			
Fig.A-4-29	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 10.3m			
Fig.A-4-30	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 10.5m			
Fig.A-4-31	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 16.10m			
Fig.A-4-32	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 16.50m			
Fig.A-4-33	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 22.3m			
Fig.A-4-34	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 22.5m			
Fig.A-4-35	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 29.3m			
Fig.A-4-36	Deformation-Pressure Curve	Deformation Test	
PHLL18TP 29.5m			
Fig.A-4-37	Deformation-Pressure Curve	Deformation Test	
PHLL19CM 4.9m			
Fig.A-4-38	Deformation-Pressure Curve	Deformation Test	

PHLL19CM 9.1m

Fig.A-4-39 Deformation-Pressure Curve Deformation Test
PHLL19CM 12.2m

Fig.A-4-40 Deformation-Pressure Curve Deformation Test
PHLL19CM 17.5m

Fig.A-4-41 Deformation-Pressure Curve Deformation Test
PHLL19CM 22.0m

Fig.A-4-42 Deformation-Pressure Curve Deformation Test
PHLL19CM 24.5m

Tab.A-4-1 Data Sheet of Plate-Jack Test Adit No.1 TD15m Right

Tab.A-4-2 Data Sheet of Plate-Jack Test Adit No.1 TD15m Left

Tab.A-4-3 Data Sheet of Plate-Jack Test Adit No.1 TD28m Right

Tab.A-4-4 Data Sheet of Plate-Jack Test Adit No.1 TD28m Left

Tab.A-4-5 Data Sheet of Plate-Jack Test Pit No.2 Depth 9m
Pararell Right

Tab.A-4-6 Data Sheet of Plate-Jack Test Pit No.2 Depth 9m
Pararell Left

Tab.A-4-7 Data Sheet of Plate-Jack Test Pit No.2 Depth 9m
Perpendicular Right (1/2)

Tab.A-4-7 Data Sheet of Plate-Jack Test Pit No.2 Depth 9m
Perpendicular Right (2/2)

Tab.A-4-8 Data Sheet of Plate-Jack Test Pit No.2 Depth 9m
Perpendicular Left(1/2)

Tab.A-4-8 Data Sheet of Plate-Jack Test Pit No.2 Depth 9m
Perpendicular Left(2/2)

Tab.A-4-9 Data Sheet of Deformation Test of Drillhole PHLL18TP
10.3m (1/4)

Tab.A-4-9 Data Sheet of Deformation Test of Drillhole PHLL18TP
10.3m (2/4)

Tab.A-4-9 Data Sheet of Deformation Test of Drillhole PHLL18TP
10.3m (3/4)

Tab.A-4-9 Data Sheet of Deformation Test of Drillhole PHLL18TP
10.3m (4/4)

Tab.A-4-10 Data Sheet of Deformation Test of Drillhole
PHLL18TP 10.5m (1/3)

Tab.A-4-10 Data Sheet of Deformation Test of Drillhole

PHLL18TP 10.5m (2/3)
Tab.A-4-10 Data Sheet of Deformation Test of Drillhole
PHLL18TP 10.5m (3/3)
Tab.A-4-11 Data Sheet of Deformation Test of Drillhole
PHLL18TP 16.1m (1/3)
Tab.A-4-11 Data Sheet of Deformation Test of Drillhole
PHLL18TP 16.1m (2/3)
Tab.A-4-11 Data Sheet of Deformation Test of Drillhole
PHLL18TP 16.1m (3/3)
Tab.A-4-12 Data Sheet of Deformation Test of Drillhole
PHLL18TP 16.5m(1/3)
Tab.A-4-12 Data Sheet of Deformation Test of Drillhole
PHLL18TP 16.5m(2/3)
Tab.A-4-12 Data Sheet of Deformation Test of Drillhole
PHLL18TP 16.5m(3/3)
Tab.A-4-13 Data Sheet of Deformation Test of Drillhole
PHLL18TP 22.3m (1/3)
Tab.A-4-13 Data Sheet of Deformation Test of Drillhole
PHLL18TP 22.3m (2/3)
Tab.A-4-13 Data Sheet of Deformation Test of Drillhole
PHLL18TP 22.3m (3/3)
Tab.A-4-14 Data Sheet of Deformation Test of Drillhole
PHLL18TP 22.5m (1/3)
Tab.A-4-14 Data Sheet of Deformation Test of Drillhole
PHLL18TP 22.5m (2/3)
Tab.A-4-14 Data Sheet of Deformation Test of Drillhole
PHLL18TP 22.5m (3/3)
Tab.A-4-15 Data Sheet of Deformation Test of Drillhole
PHLL18TP 29.3m (1/3)
Tab.A-4-15 Data Sheet of Deformation Test of Drillhole
PHLL18TP 29.3m (2/3)
Tab.A-4-15 Data Sheet of Deformation Test of Drillhole
PHLL18TP 29.3m (3/3)
Tab.A-4-16 Data Sheel of Deformation Test of Drillhole
PHLL18TP 29.5m (1/3)
Tab.A-4-16 Data Sheet of Deformation Test of Drillhole

PHLL18TP 29.5m (2/3)

Tab.A-4-16 Data Sheet of Deformation Test of Drillhole
PHLL18TP 29.5m (3/3)

Tab.A-4-17 Data Sheet of Deformation Test of Drillhole
PHLL19CM 4.9m

Tab.A-4-18 Data Sheet of Deformation Test of Drillhole
PHLL19CM 9.1m

Tab.A-4-19 Data Sheet of Deformation Test of Drillhole
PHLL19CM 12.2m

Tab.A-4-20 Data Sheet of Deformation Test of Drillhole
PHLL19CM 17.5m

Tab.A-4-21 Data Sheet of Deformation Test of Drillhole
PHLL19CM 22.0m

Tab.A-4-22 Data Sheet of Deformation Test of Drillhole
PHLL19CM 24.5m

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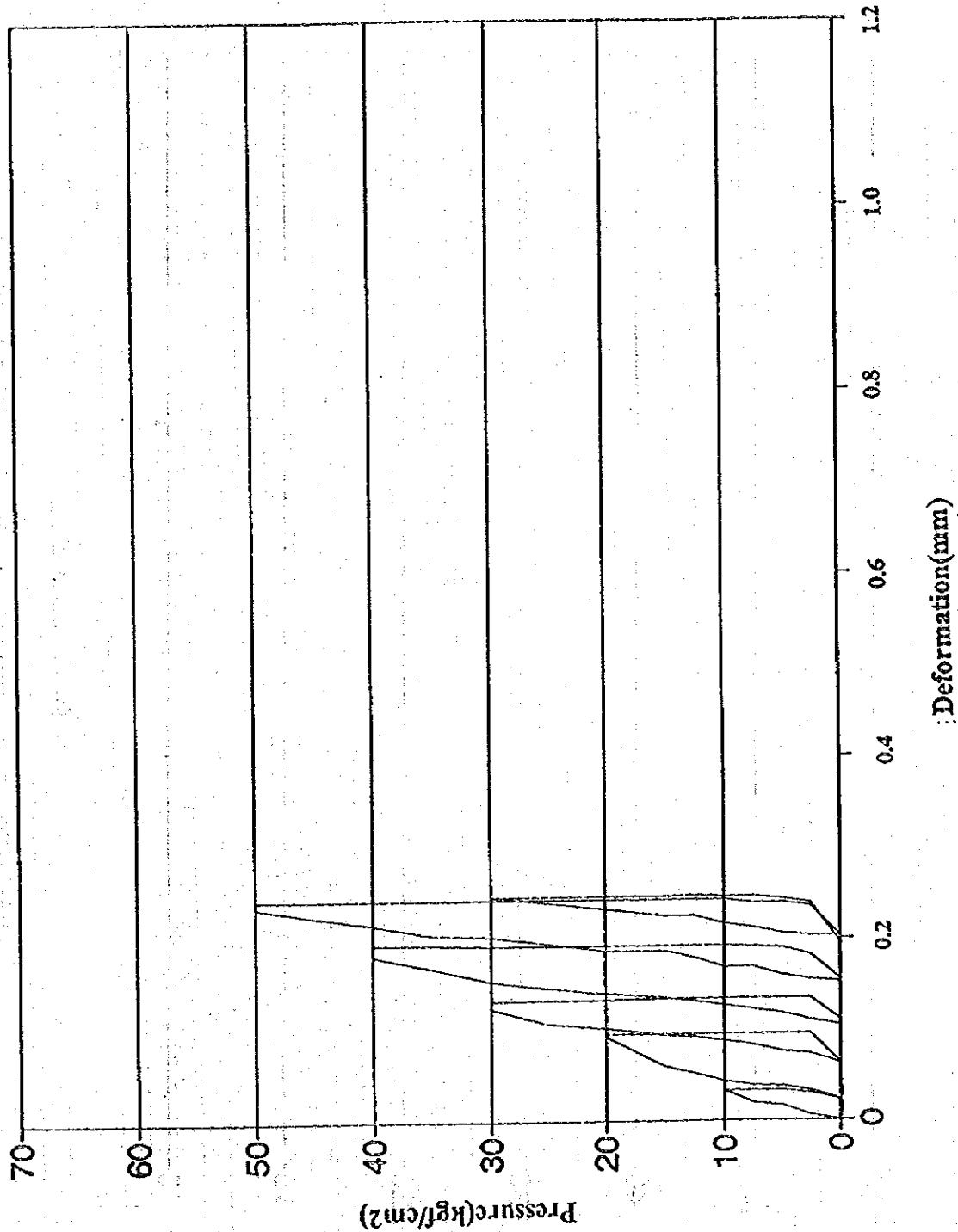
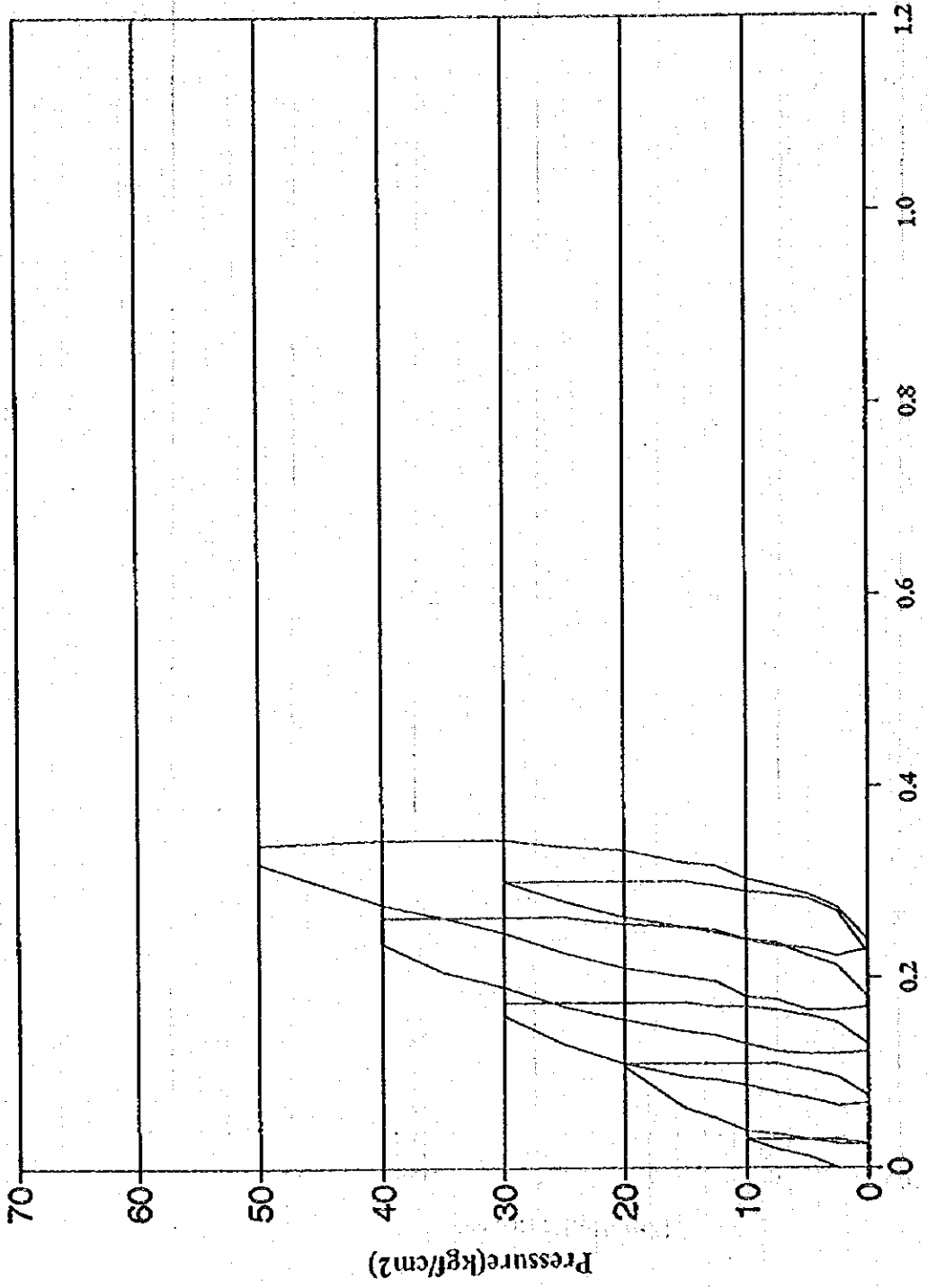


Fig.A-4-1 Deformation-Pressure Curve Adit No.1 TD15m Right

Diagram was offered by ICE.



Deformation-Pressure Curve

Fig.A-4-2 Deformation-Pressure Curve Adit No.1 TD15m Left

Diagram was offered by ICE.

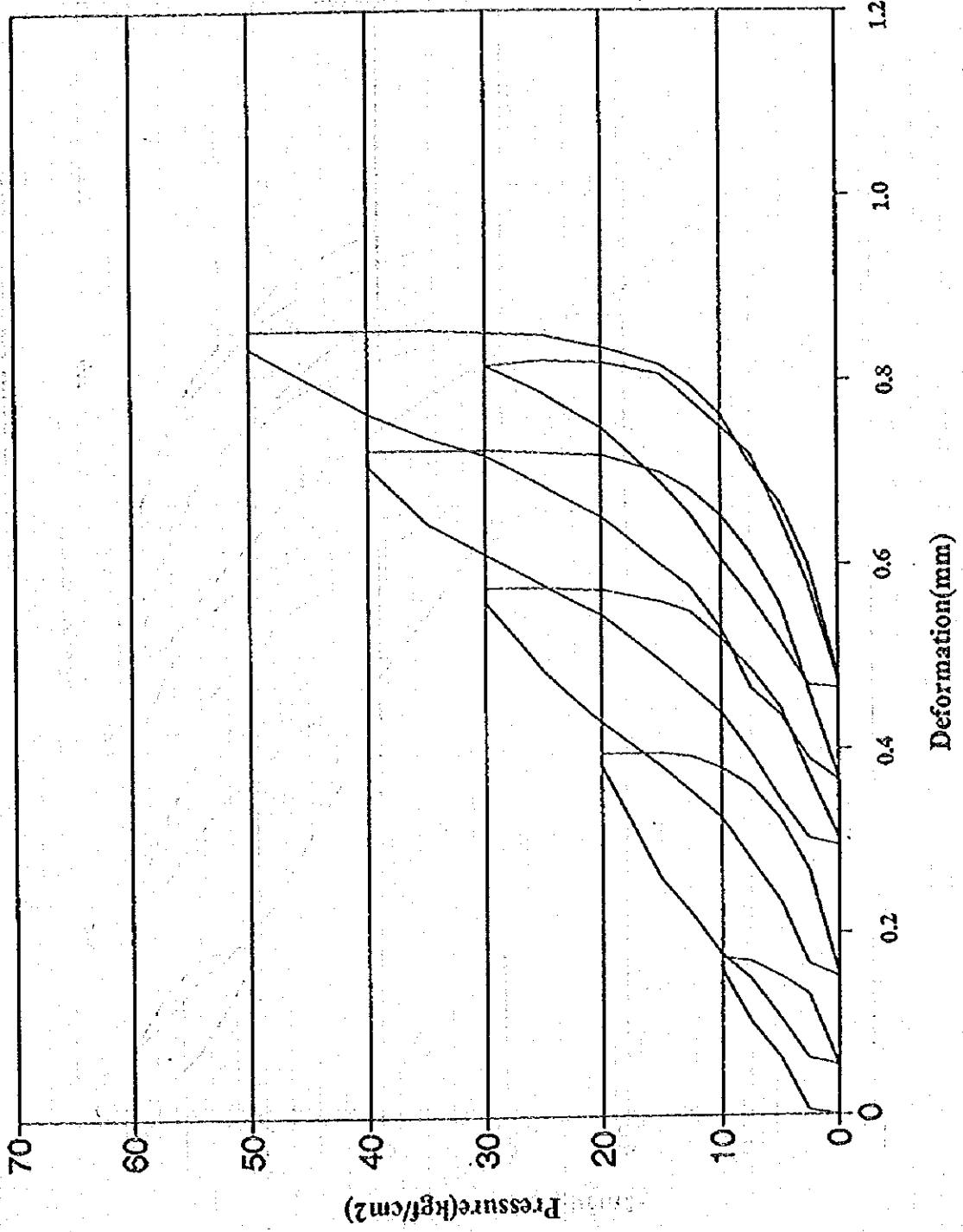


Fig.A-4-3 Deformation-Pressure Curve Adit No.1 TD28m Right

Diagram was offered by ICE.

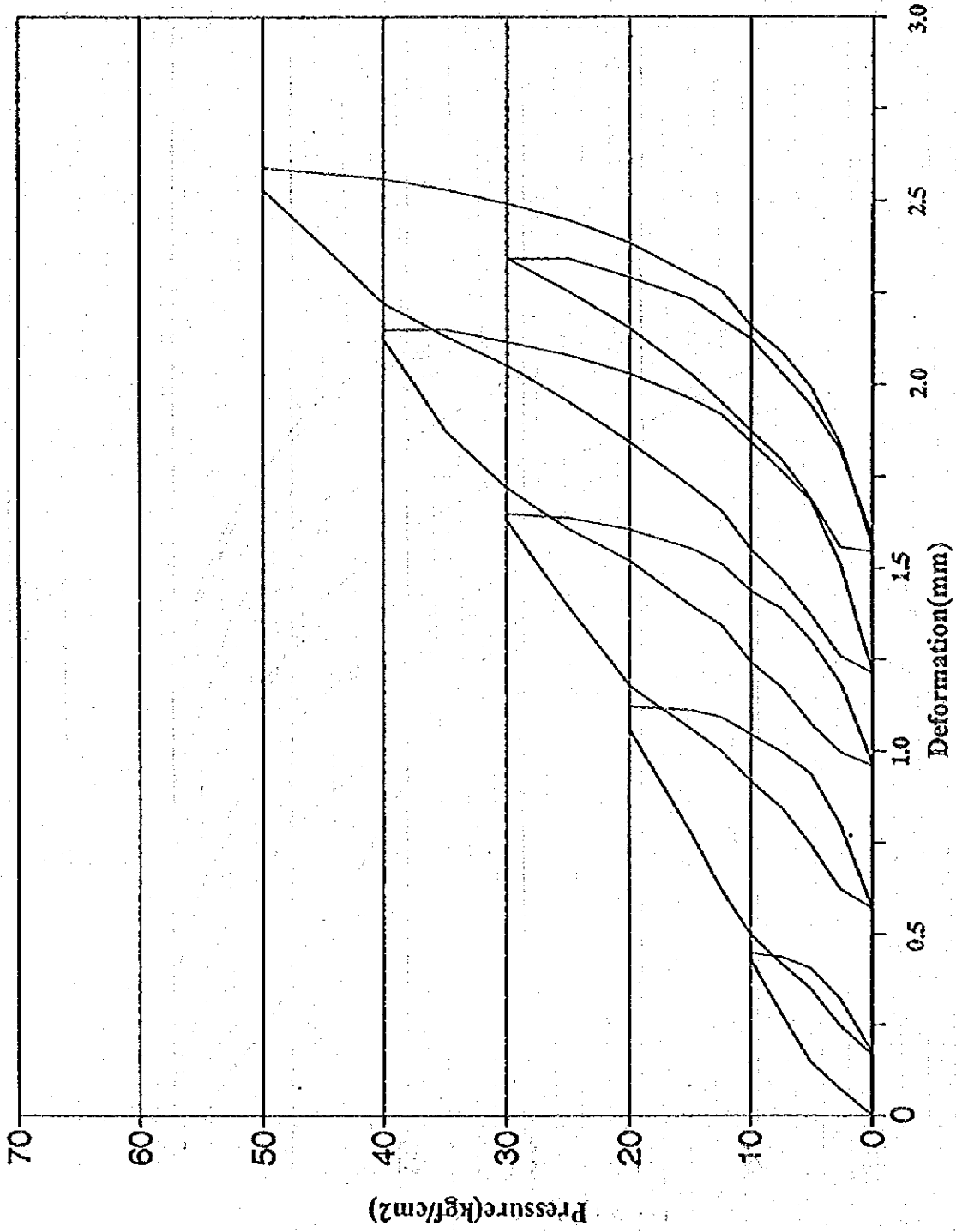


Fig.A-4-5 Deformation-Pressure Curve Pit No.2 Depth 9m Pararell Right

Diagram was offered by ICE.

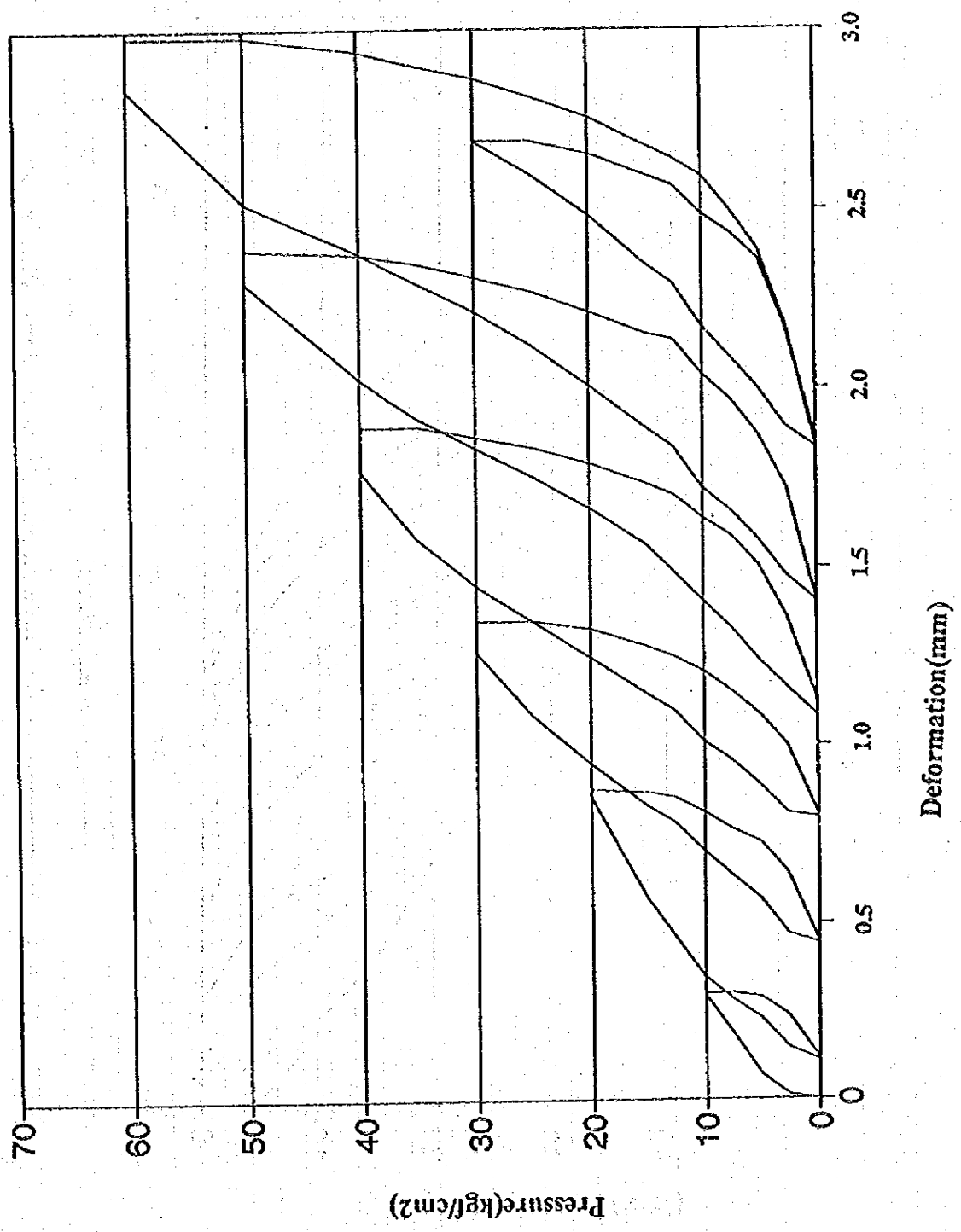


Fig.A-4-7 Deformation-Pressure Curve Pit No.2 Depth 9m Perpendicular Right

Diagram was offered by ICE.

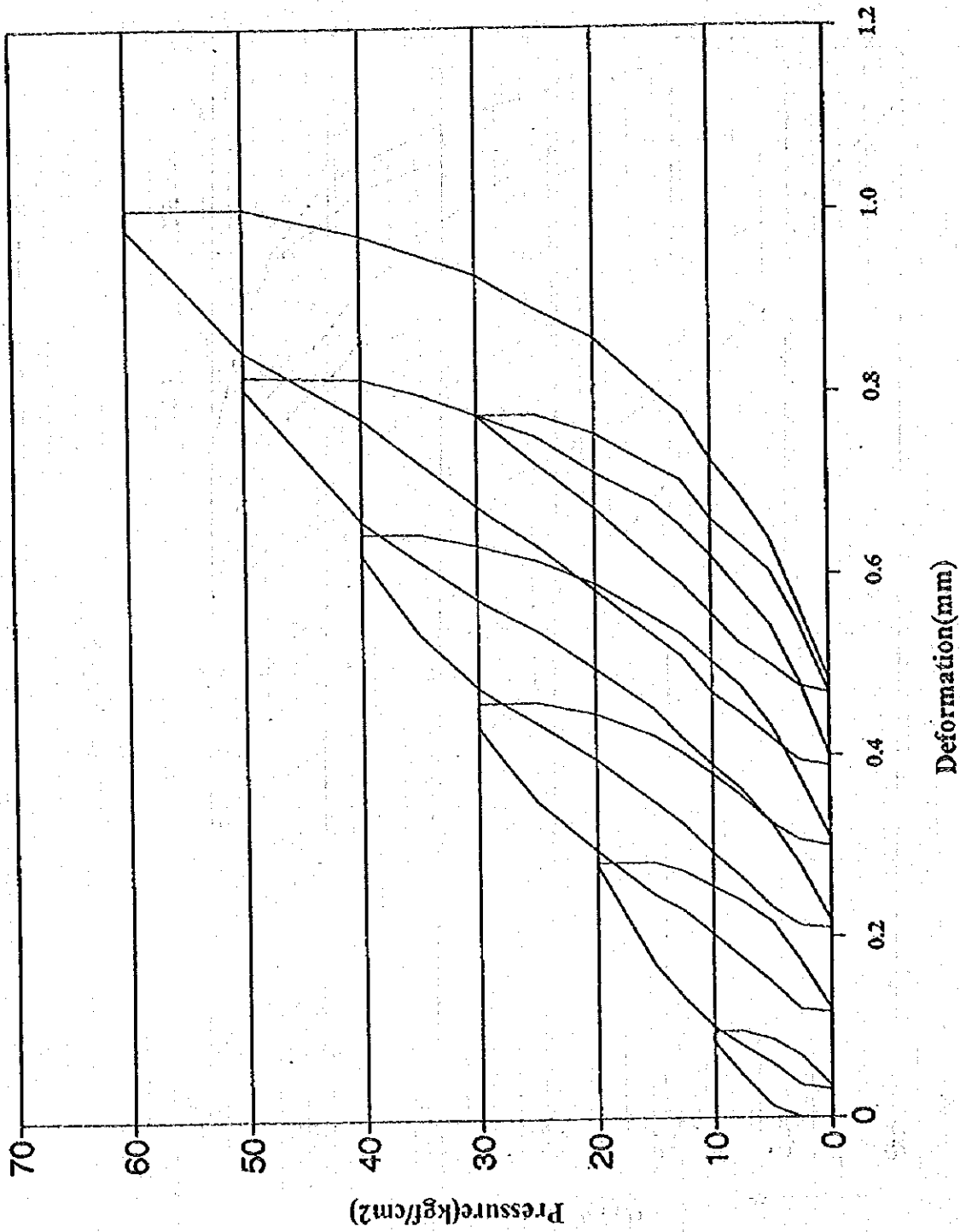


Fig.A-4-8 Deformation-Pressure Curve Pit No.2 Depth 9m Perpendicular Left

Diagram was offered by ICE

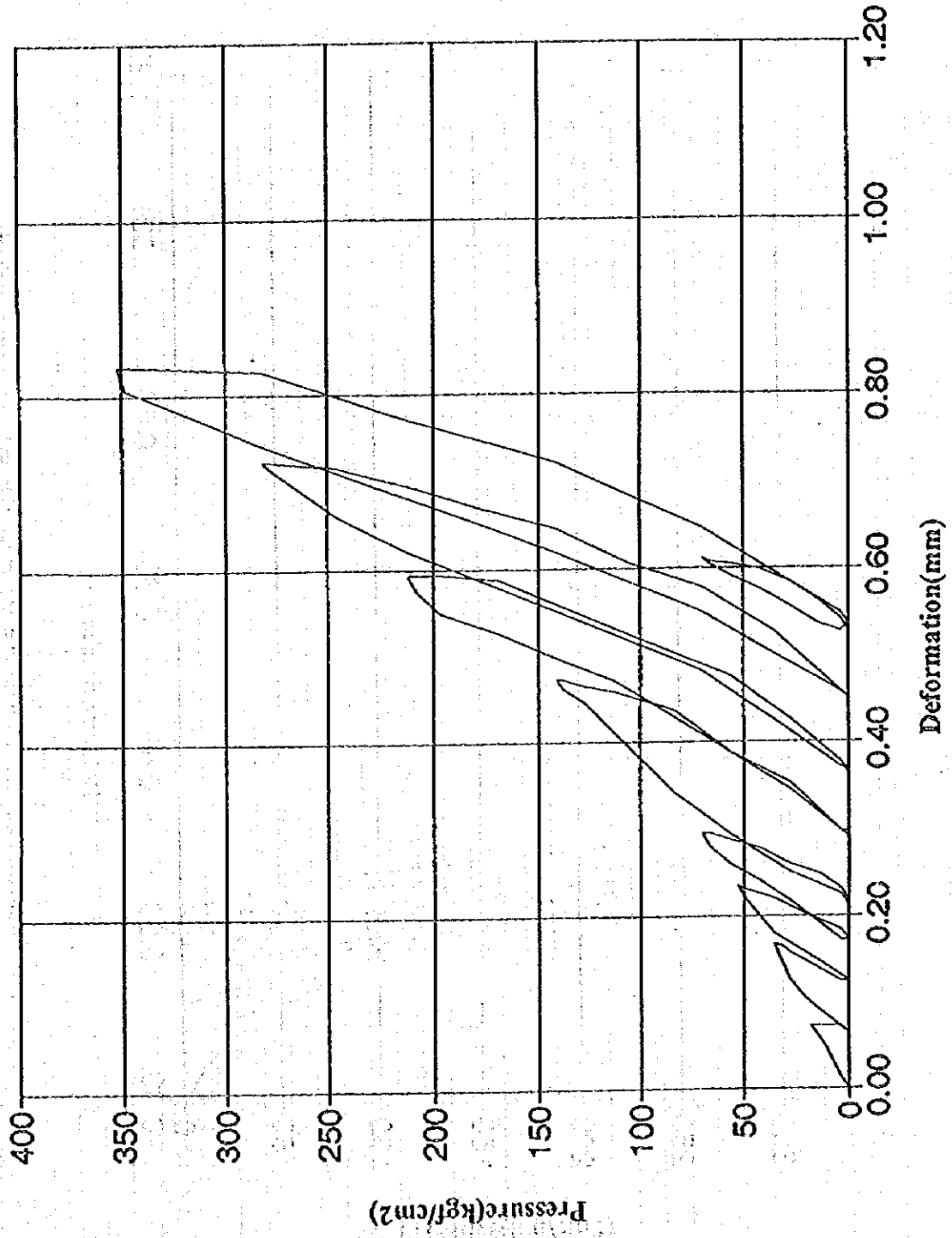


Fig.A-4-9 Deformation-Pressure Curve Deformation Test PHELL2SP 8.7m

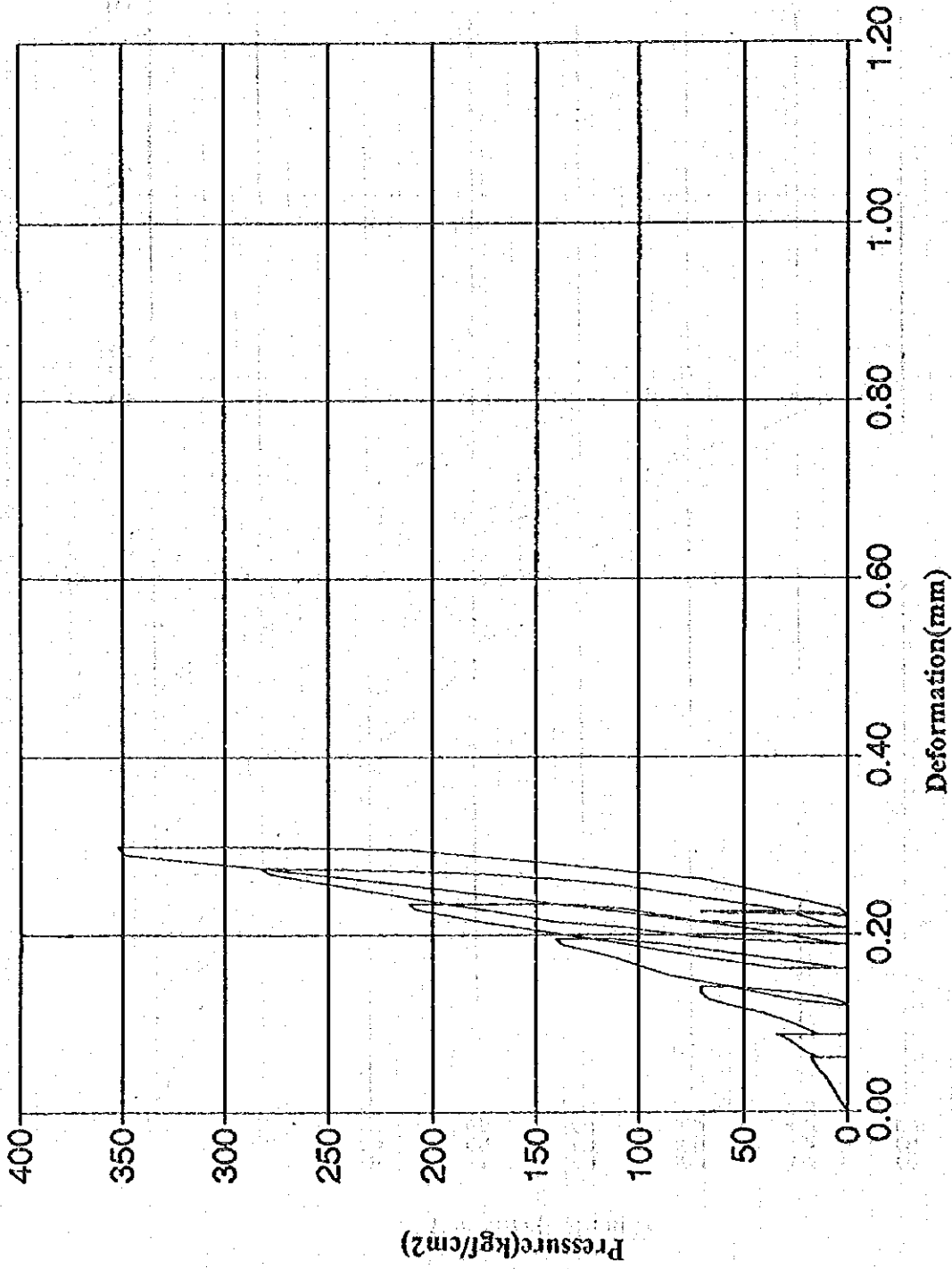


Fig-A-4-10 Deformation-Pressure Curve Deformation Test PHLL2SP 15.0m

Diagram was offered by ICE.

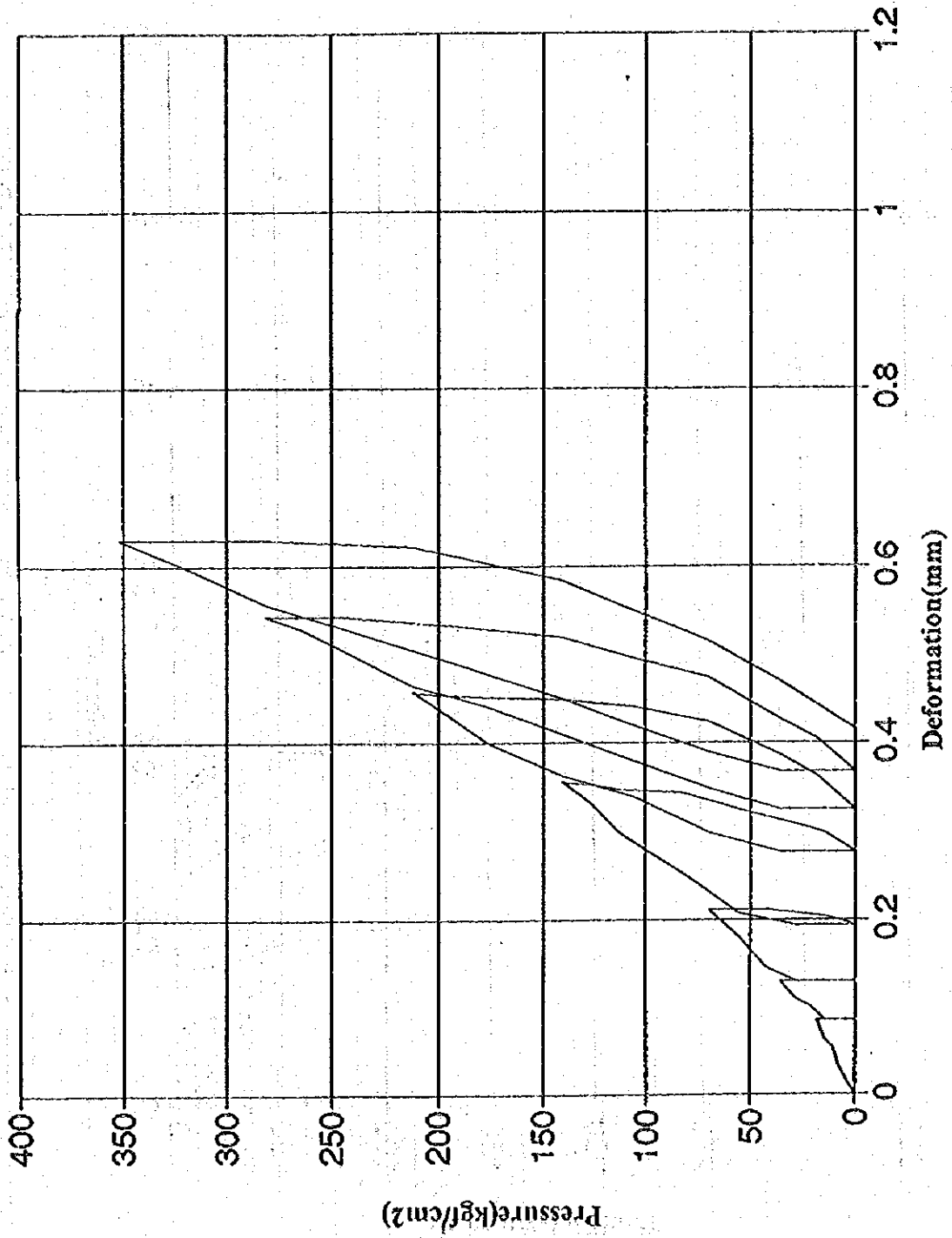


Fig.A-4-12 Deformation-Pressure Curve Deformation Test PHL2SP 25.0m

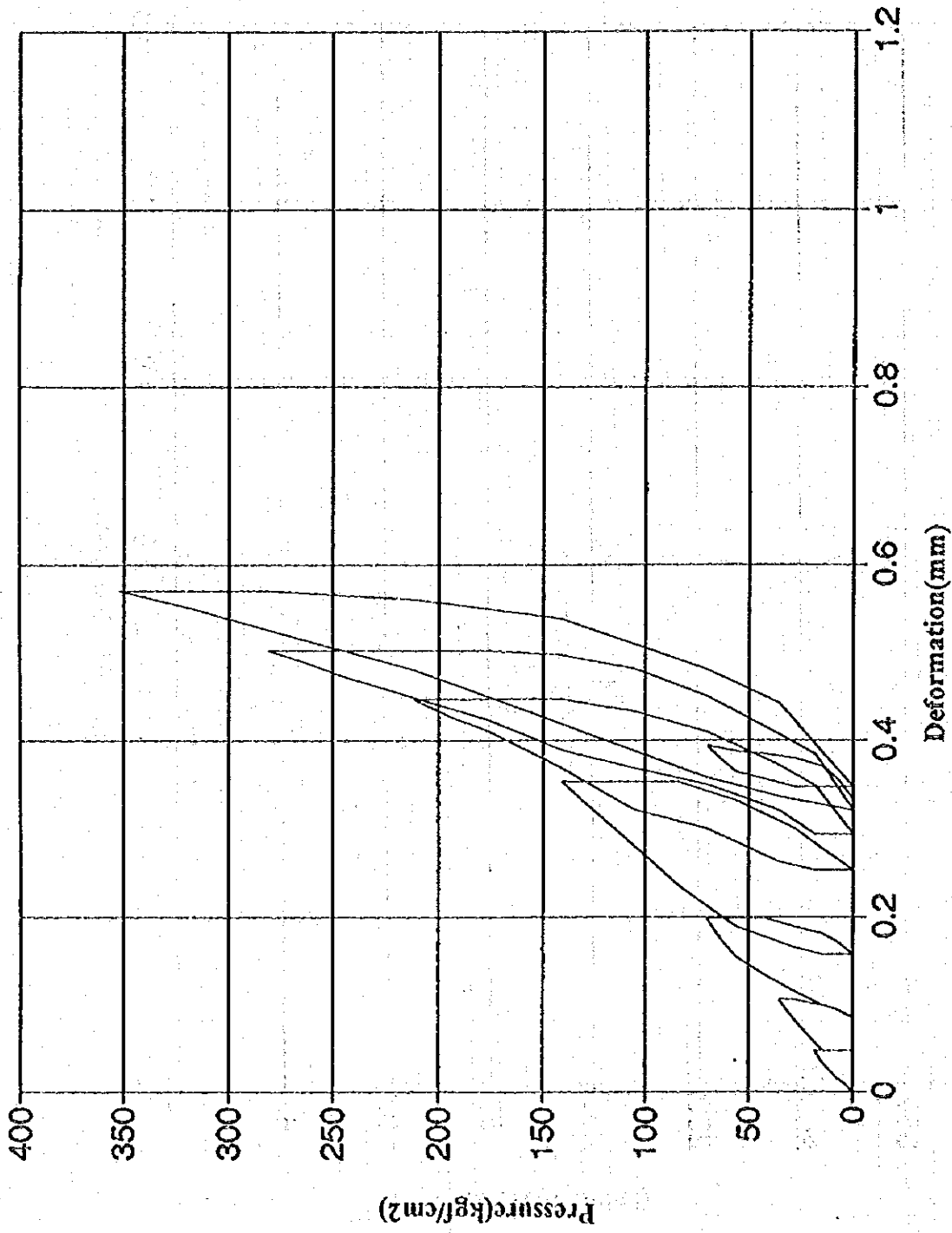


Fig-A-4-13 Deformation-Pressure Curve Deformation Test PBL2SP 25.4m

Diagram was offered by ICE.

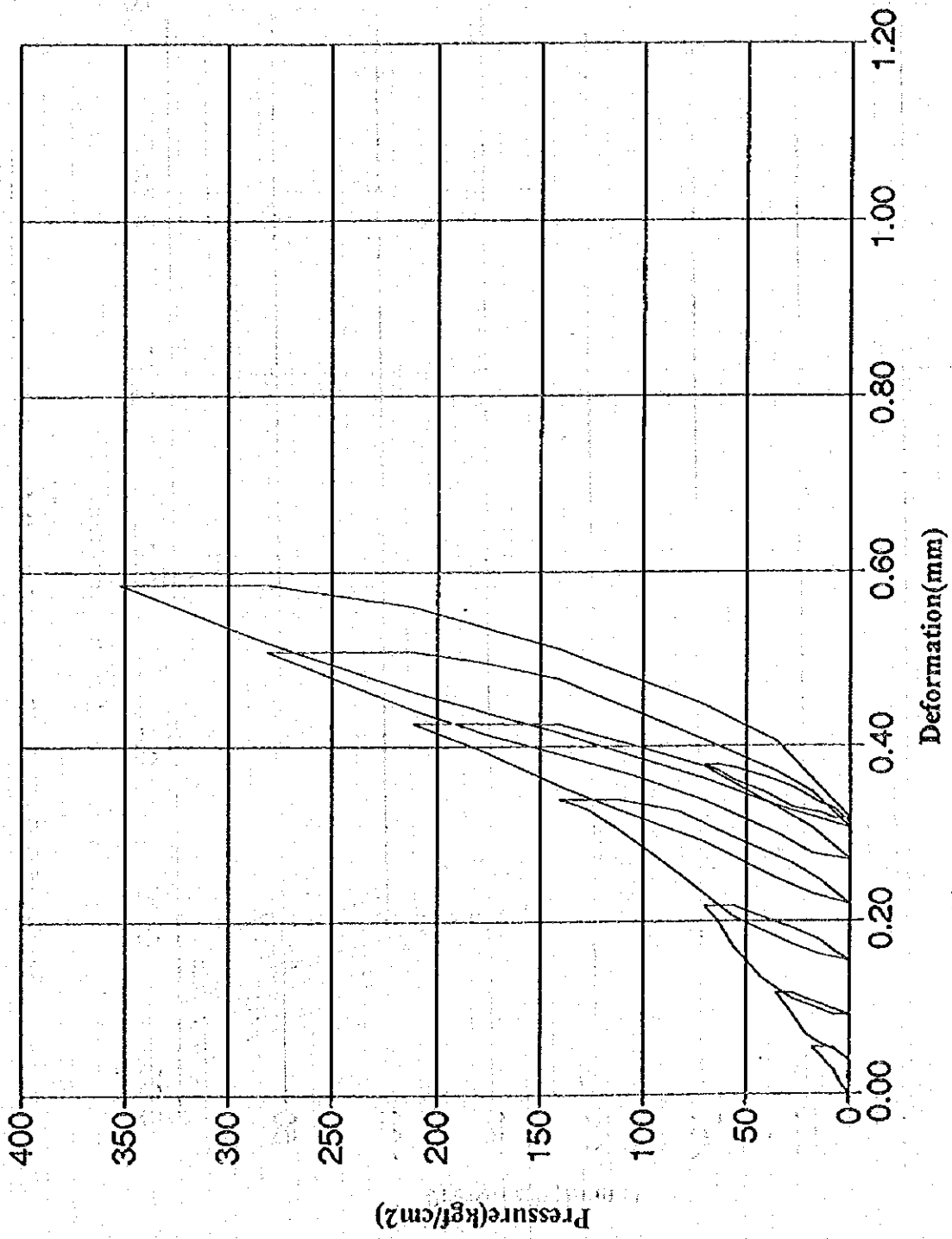


Fig-A-4-14 Deformation-Pressure Curve Deformation Test PHELL3SP 7.0m

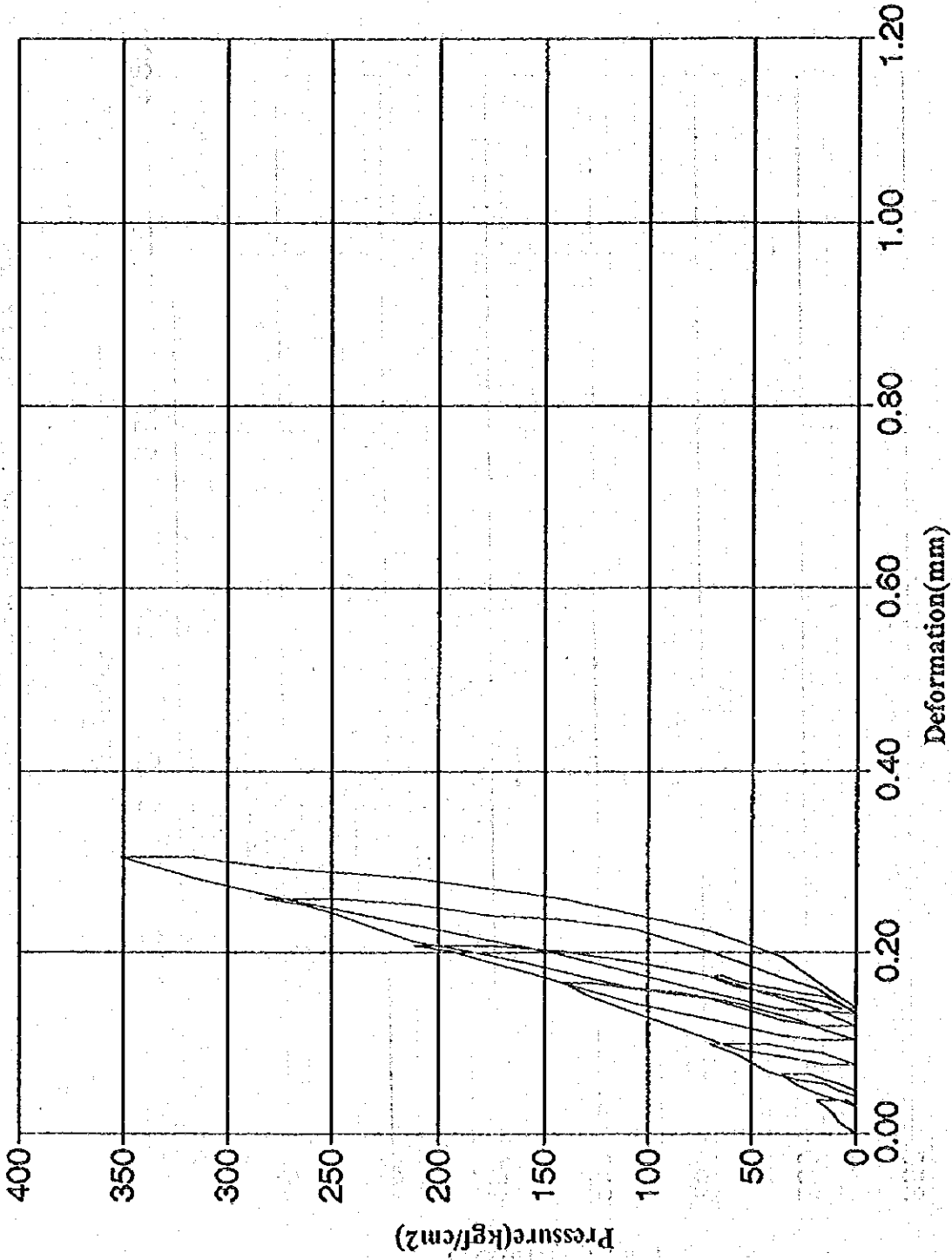


Fig.A-4-15 Deformation-Pressure Curve Deformation Test PHLL3SP 8.0m

Diagram was offered by ICE

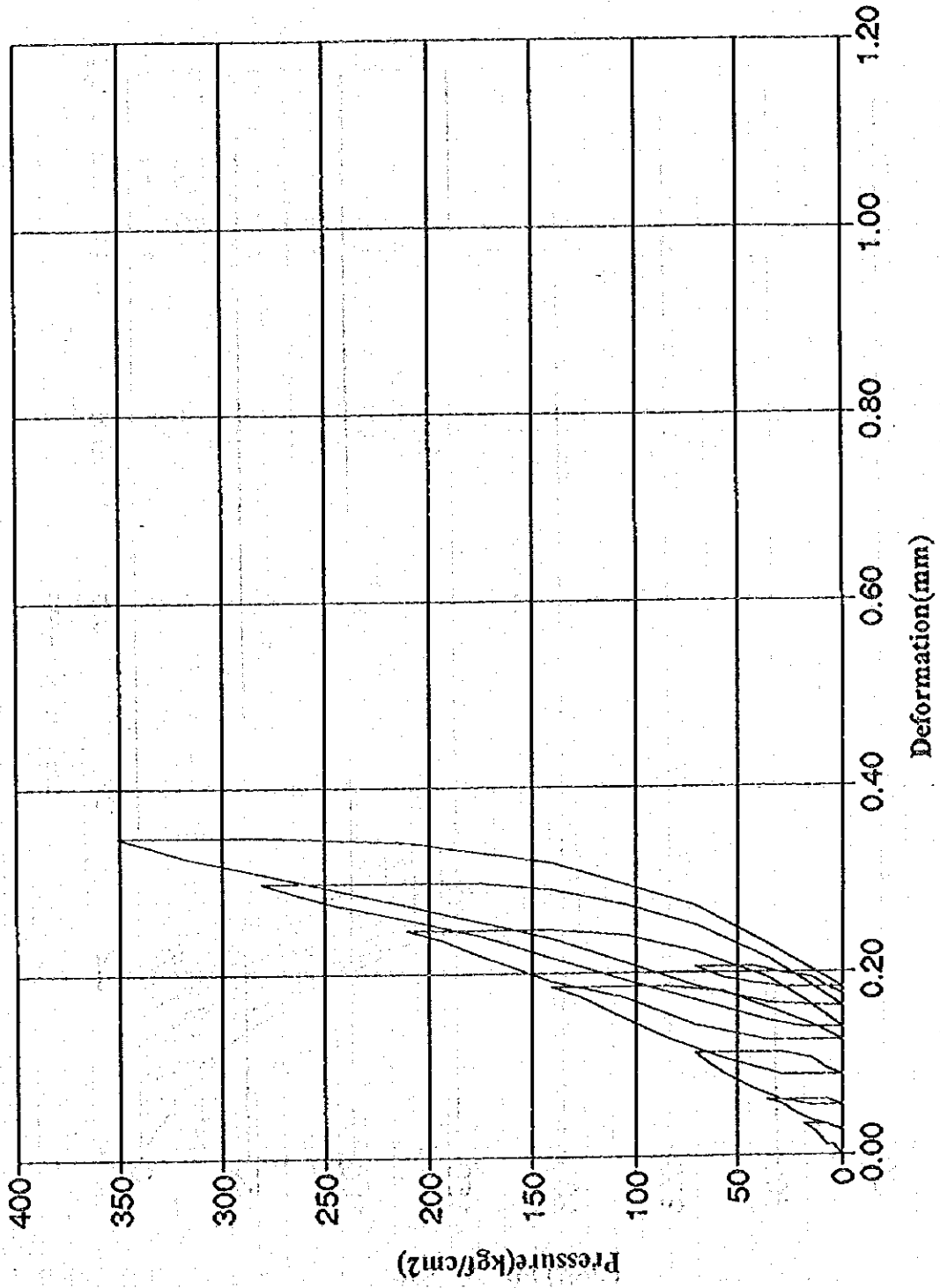


Fig-A-4-16 Deformation-Pressure Curve Deformation Test PELL3SP 24.5m

Diagram was offered by ICE.

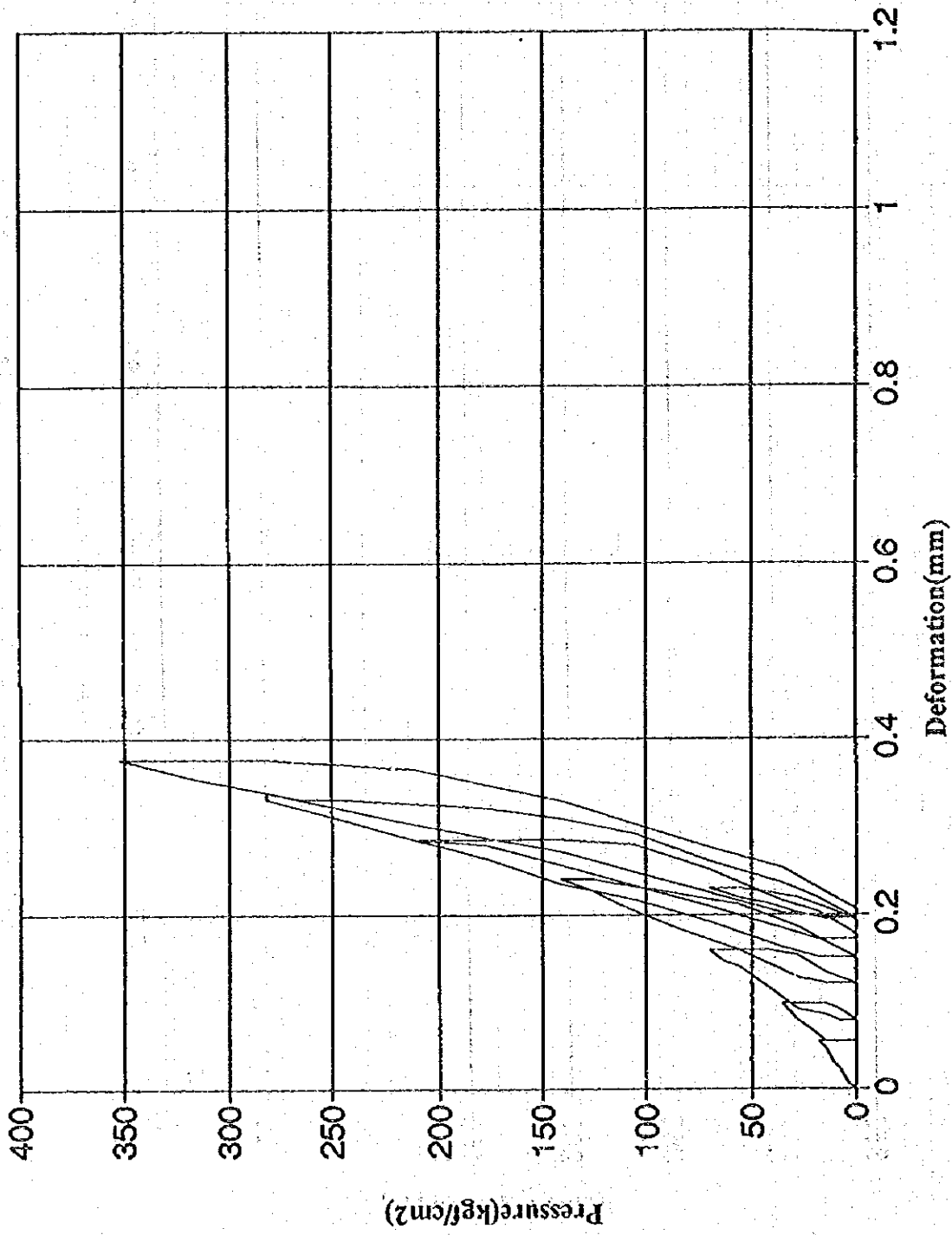


Fig.A-4-17 Deformation-Pressure Curve Deformation Test PHELL3SP 25.0m

Diagram was offered by ICE.

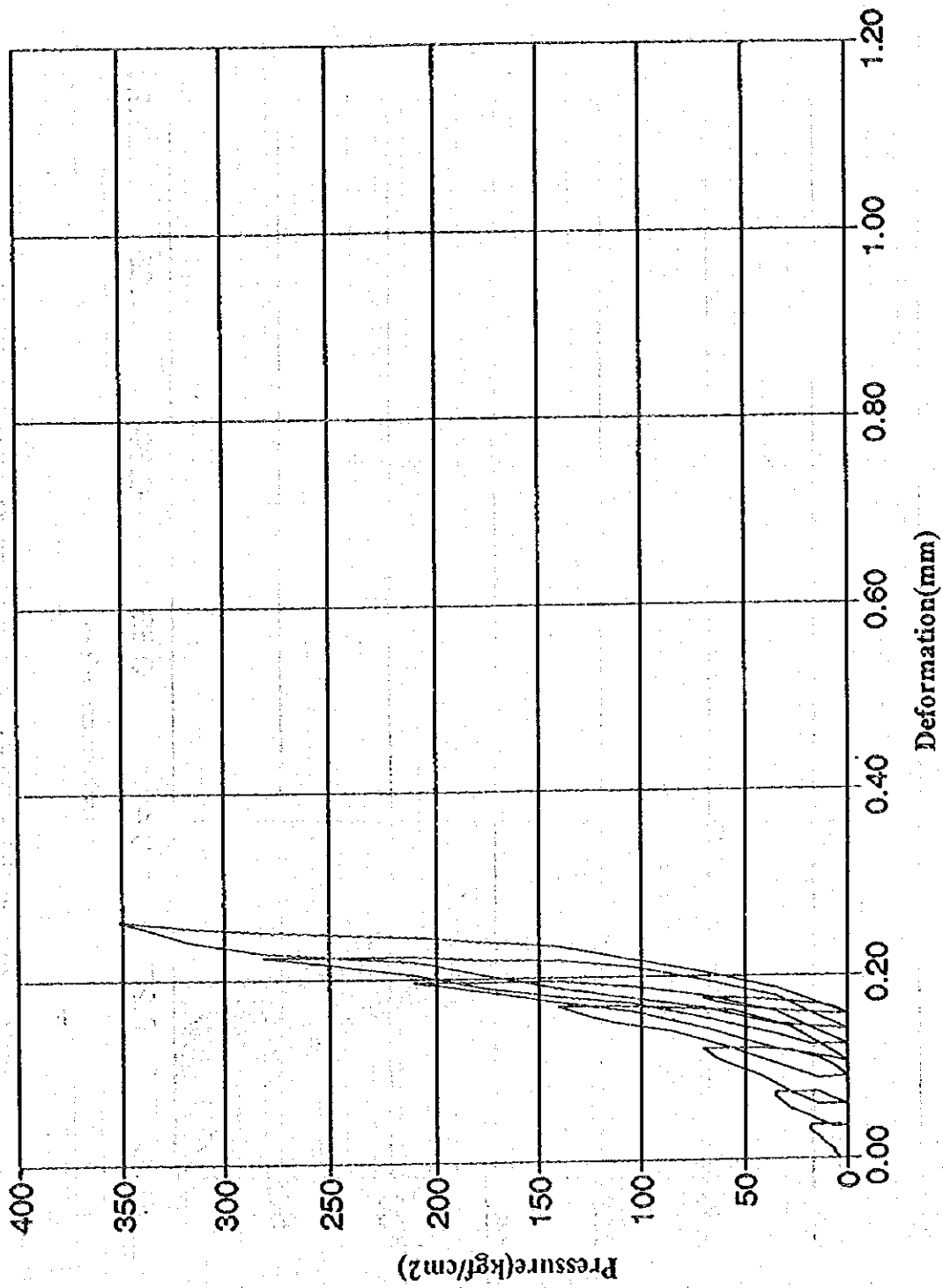


Fig.A-4-18 Deformation-Pressure Curve Deformation Test PHLJ3SP 39.3m

Diagram was offered by ICE.

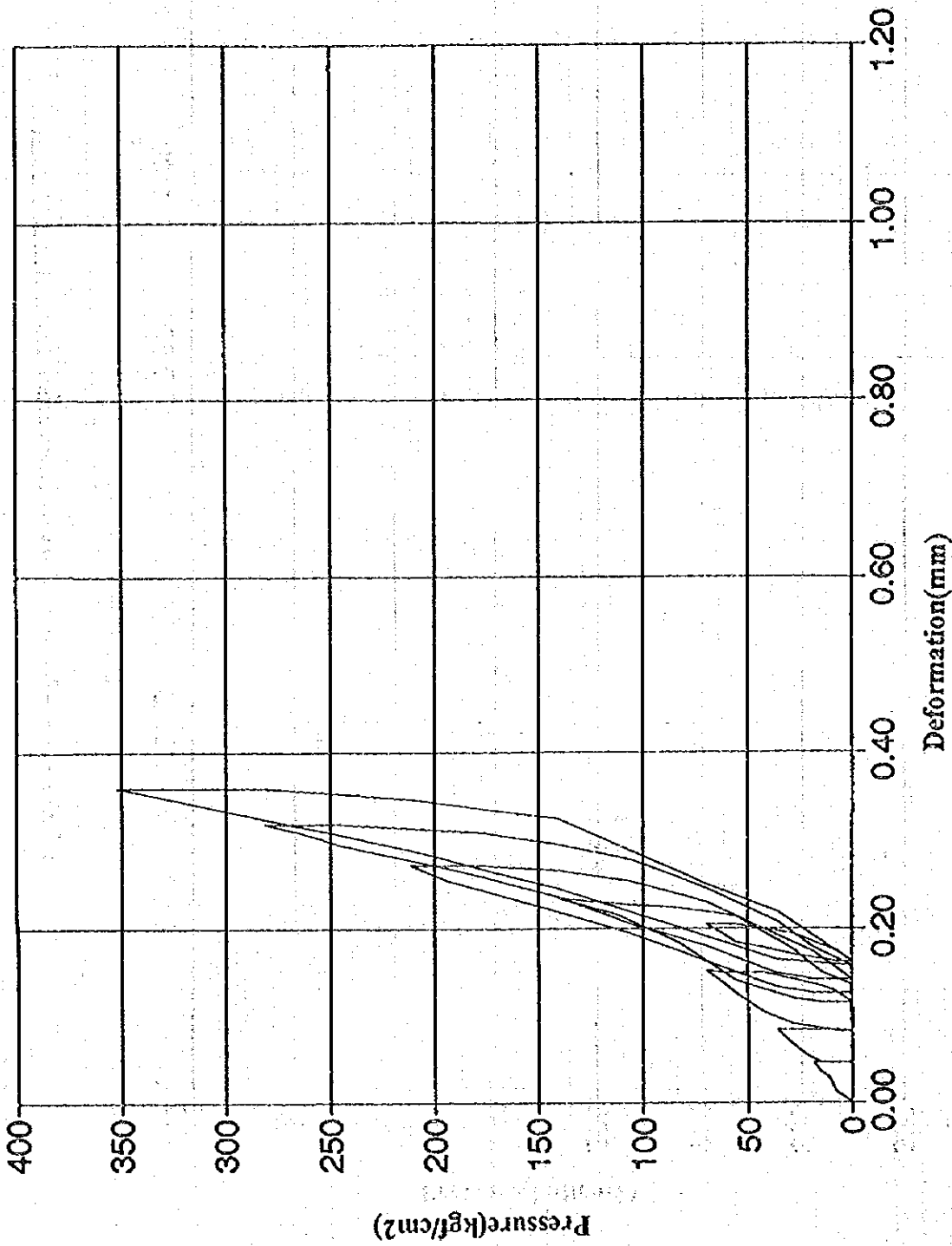


Fig.A-4-19 Deformation-Pressure Curve Deformation Test PHELL3SP 39.8m

Diagram was offered by ICE.

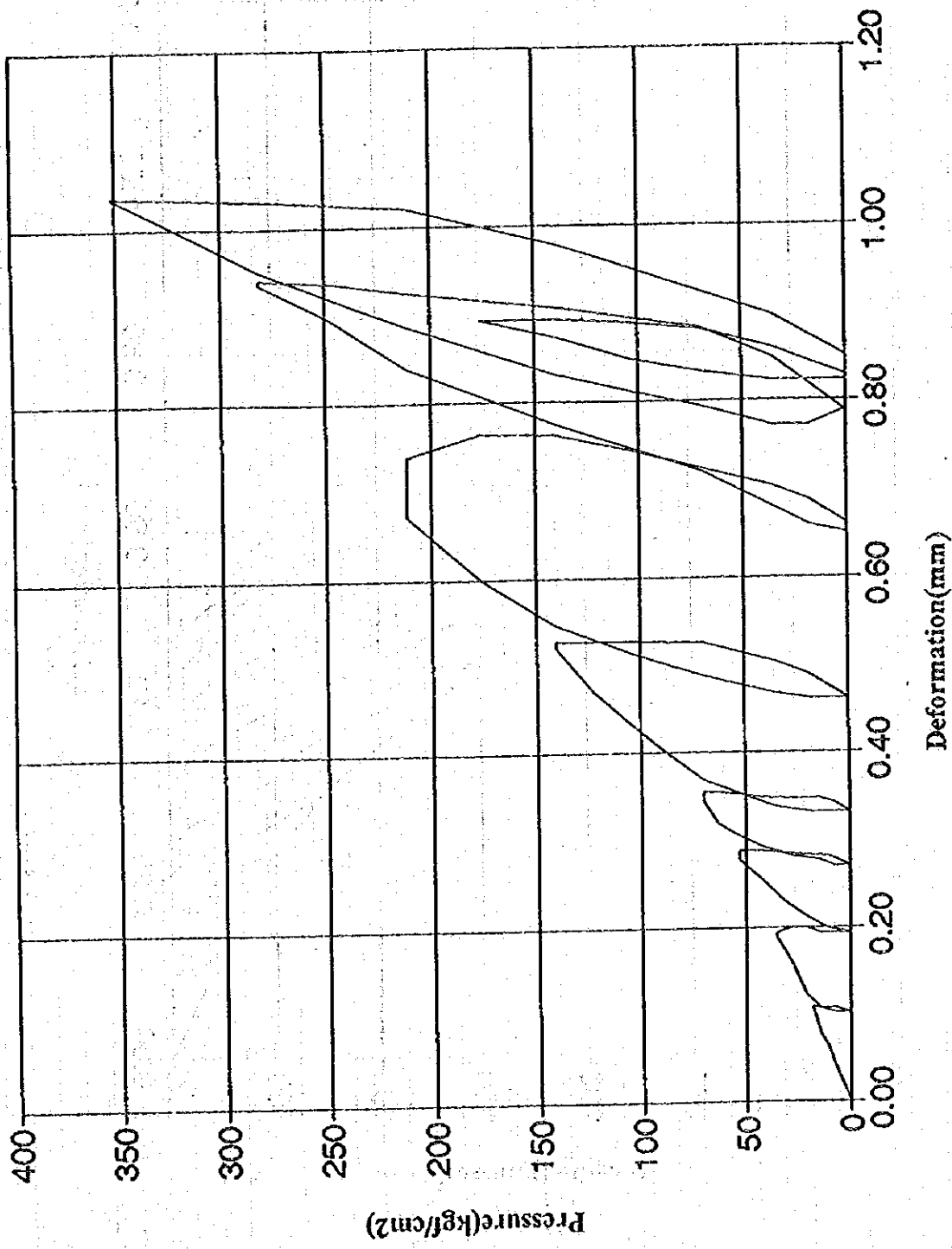


Fig.A-4-20 Deformation-Pressure Curve Deformation Test PHL4SP 20.1m

Diagram was offered by ICE.

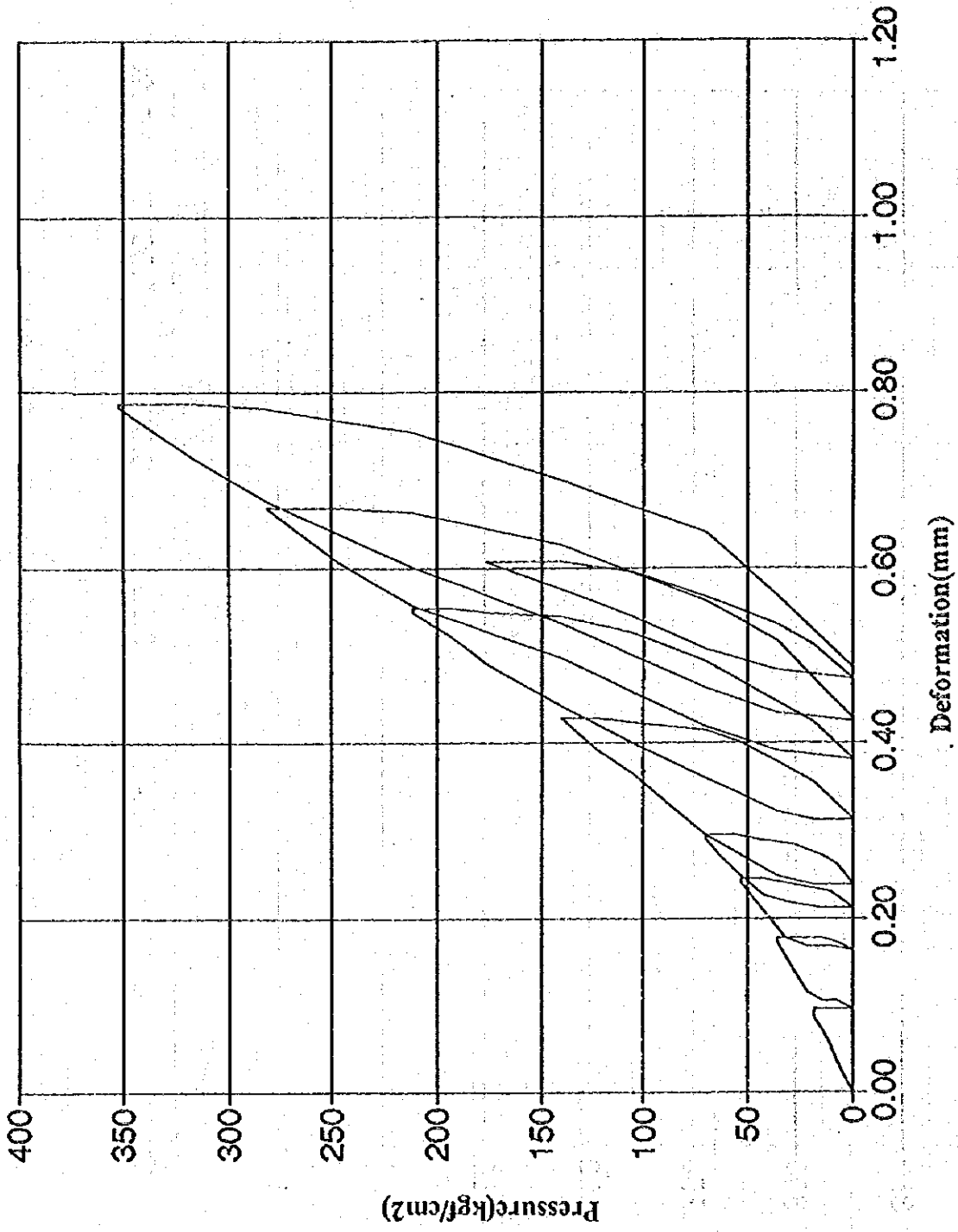


Fig.A-4-21 Deformation-Pressure Curve Deformation Test PHELL4SP 29.7m

Diagram was offered by ICE.

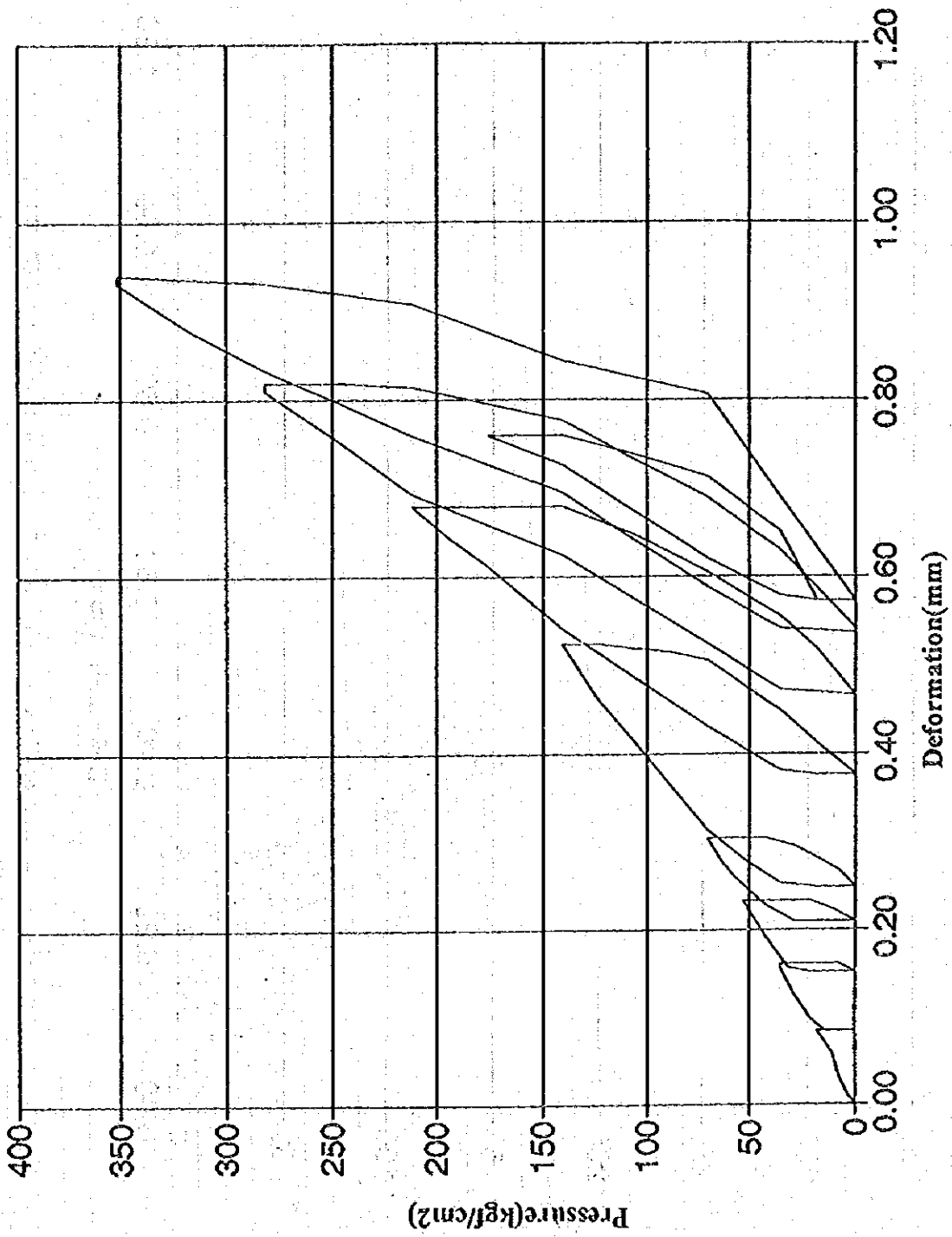


Fig.A-4-22 Deformation-Pressure Curve Deformation Test PELL4SP 30.7m

Diagram was offered by ICE.

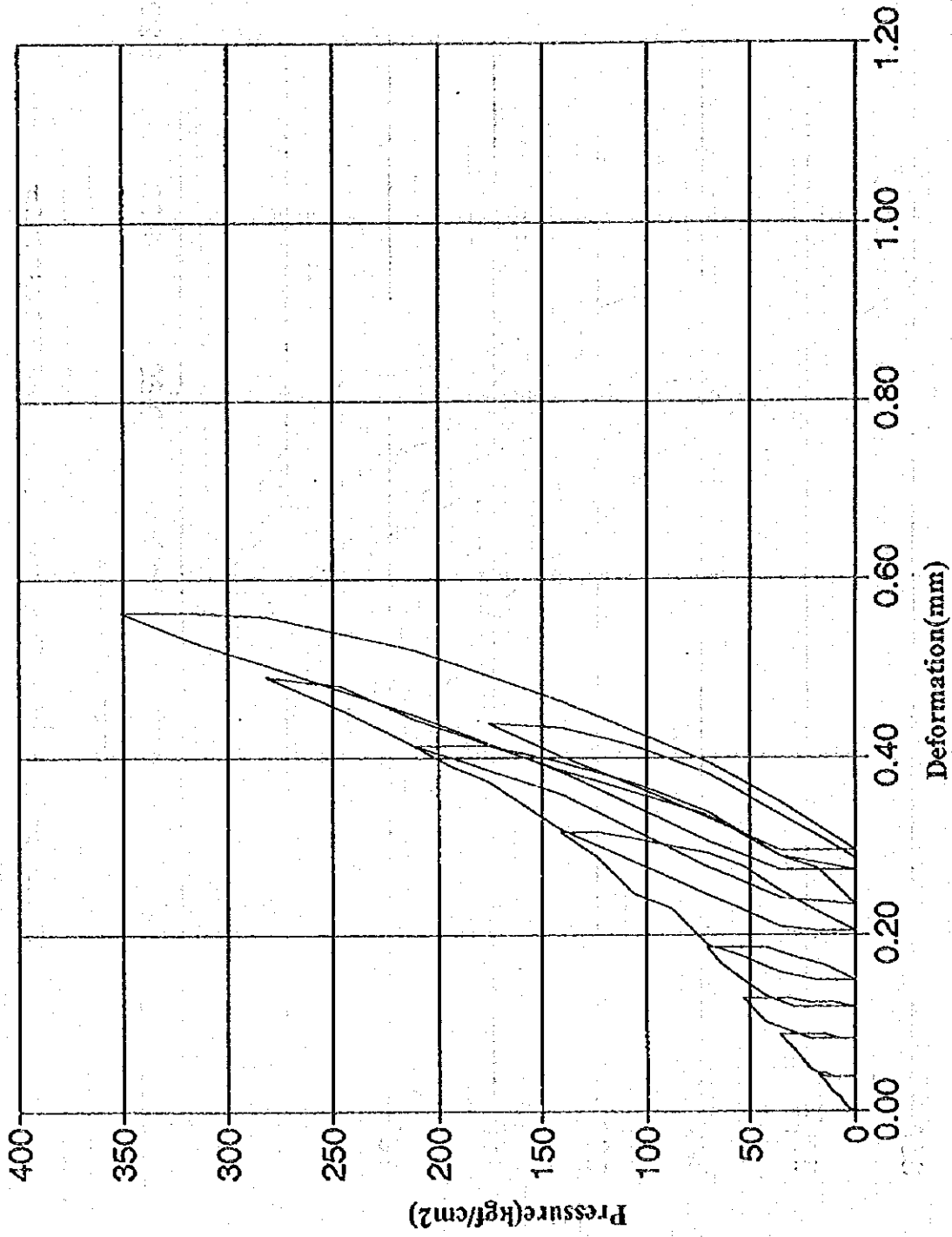


Fig.A-4-23 Deformation-Pressure Curve Deformation Test PELL4SP 40.0m

Diagram was offered by ICE

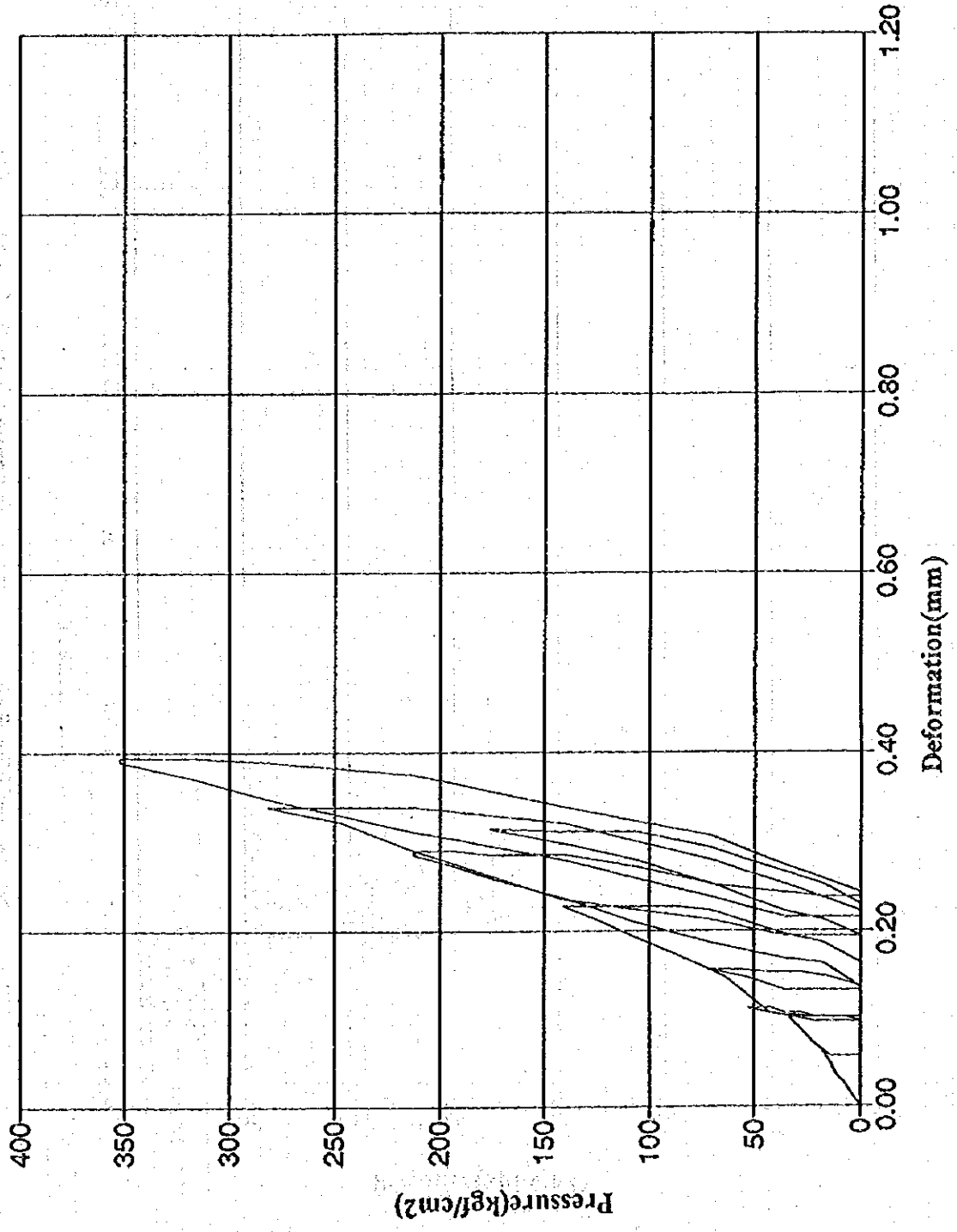


Fig.A-4-24 Deformation-Pressure Curve Deformation Test PHL4SP 40.3m

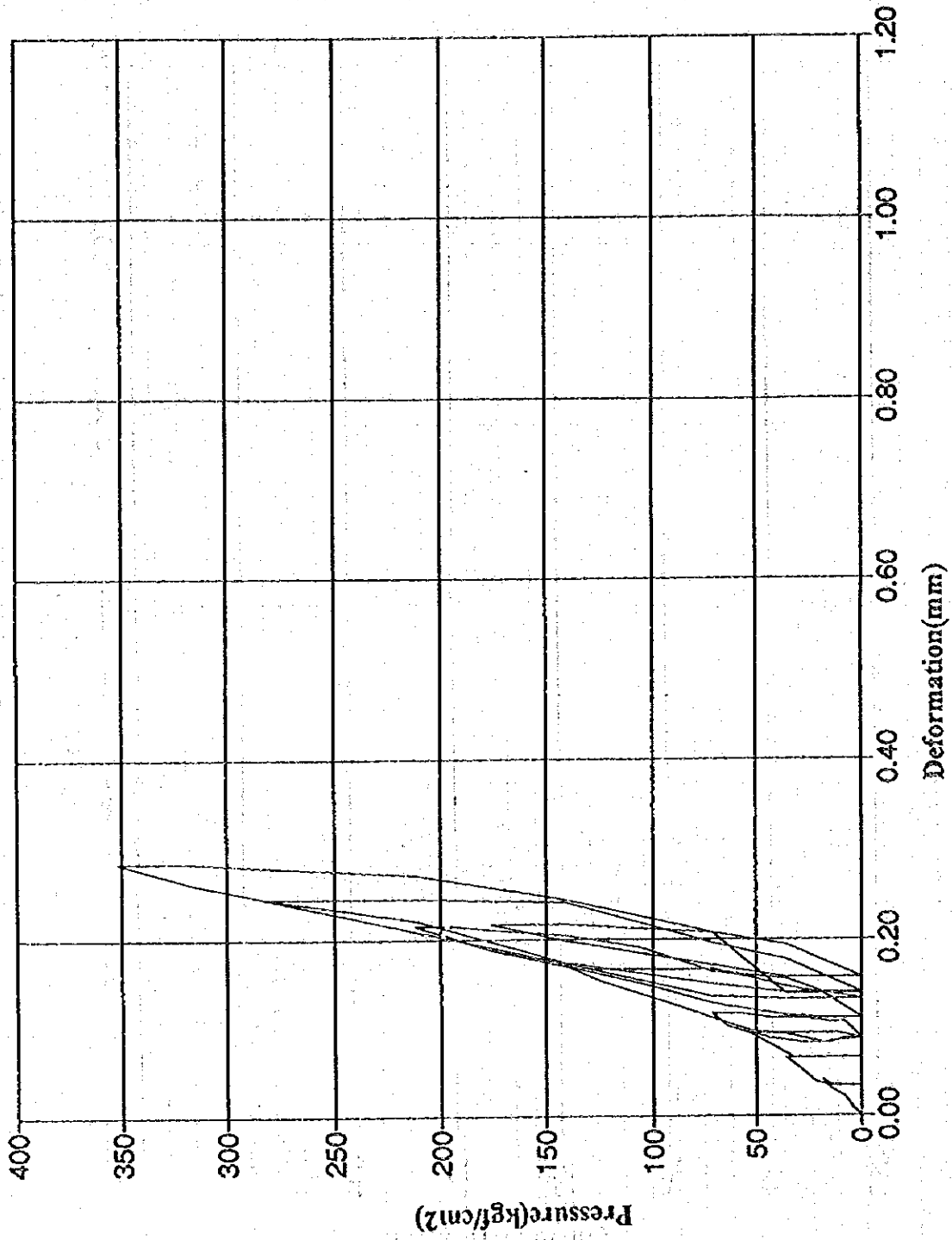


Fig.A-4-25 Deformation-Pressure Curve Deformation Test PHL4SP 49.8m

Diagram was offered by ICE

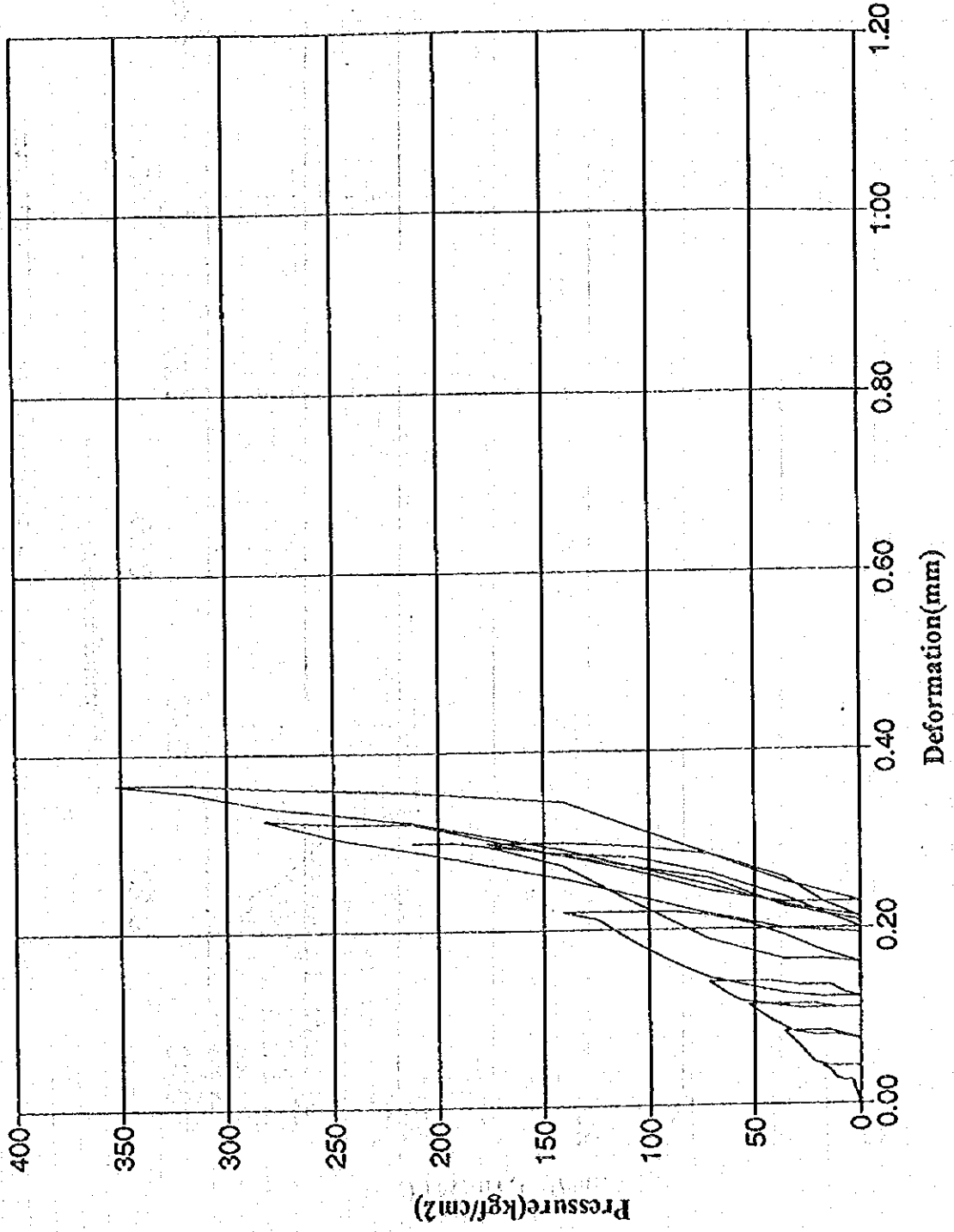


Fig.A-4-26 Deformation-Pressure Curve Deformation Test PHL4SP 50.3m

Diagram was offered by ICE.

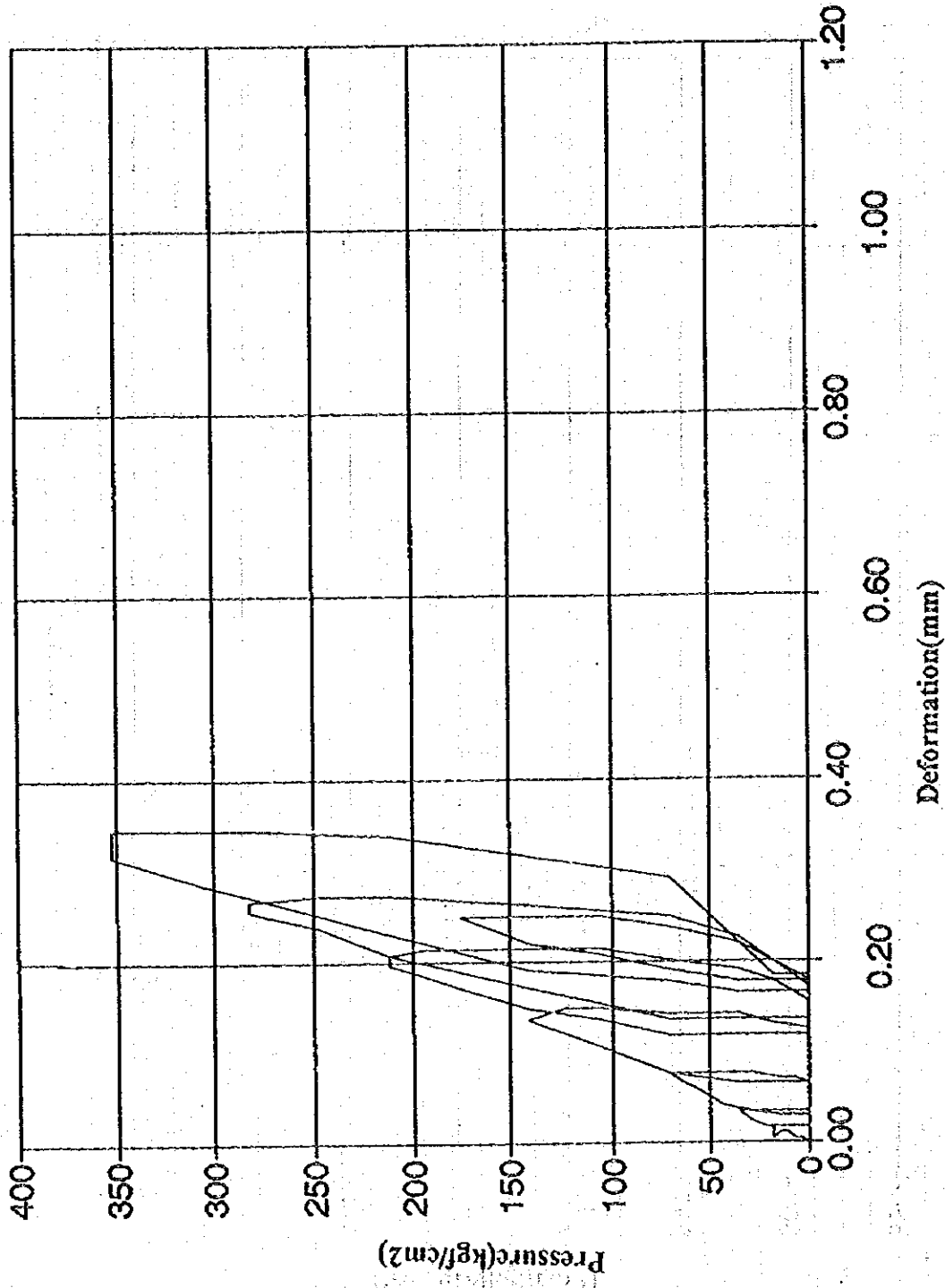


Fig.A-4-27 Deformation-Pressure Curve Deformation Test PHLL16CM 3.4m

Diagram was offered by ICE.

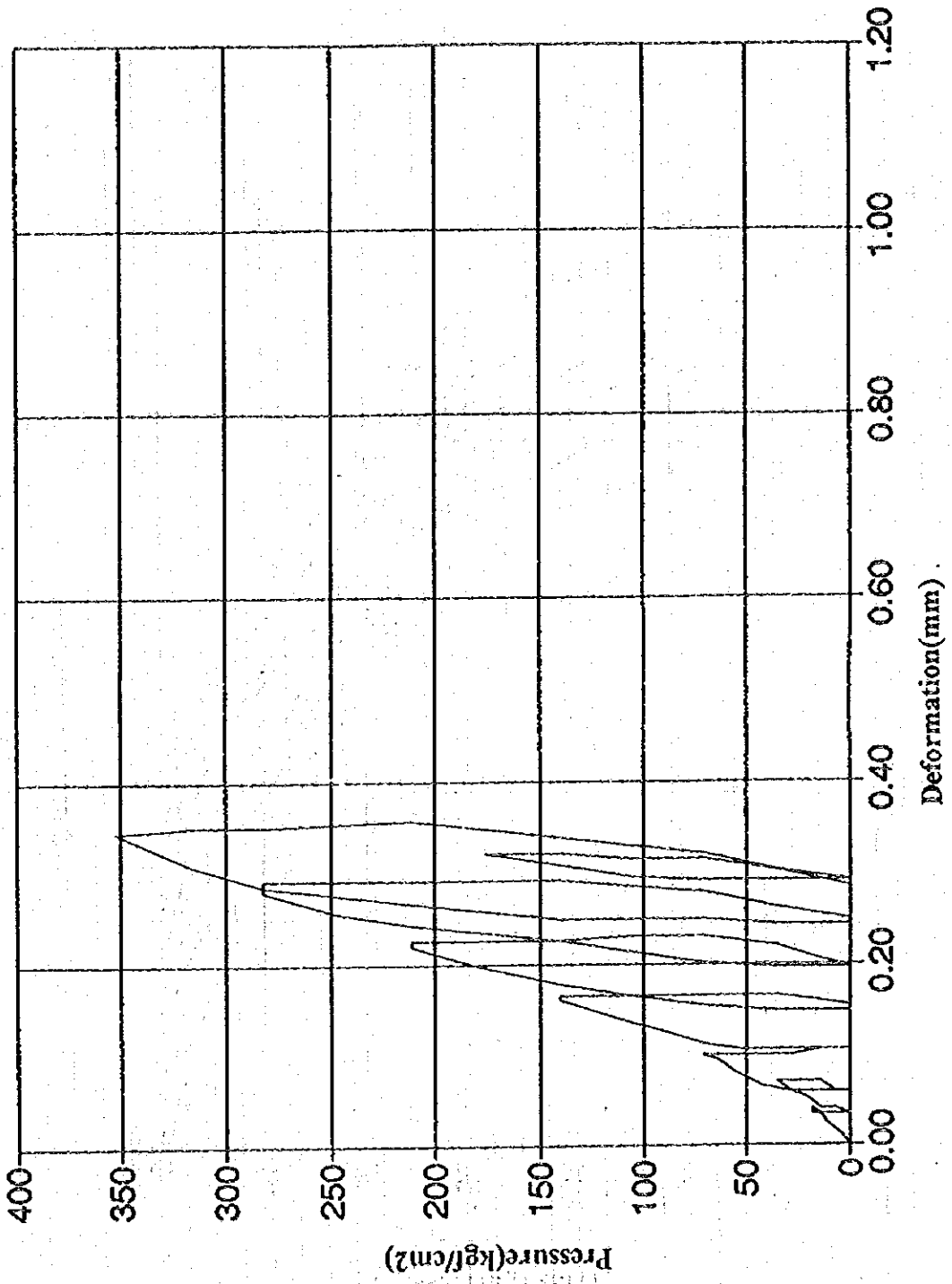


Fig.A-4-28 Deformation-Pressure Curve Deformation Test PHLL16CM 3.6m

Diagram was offered by ICE.

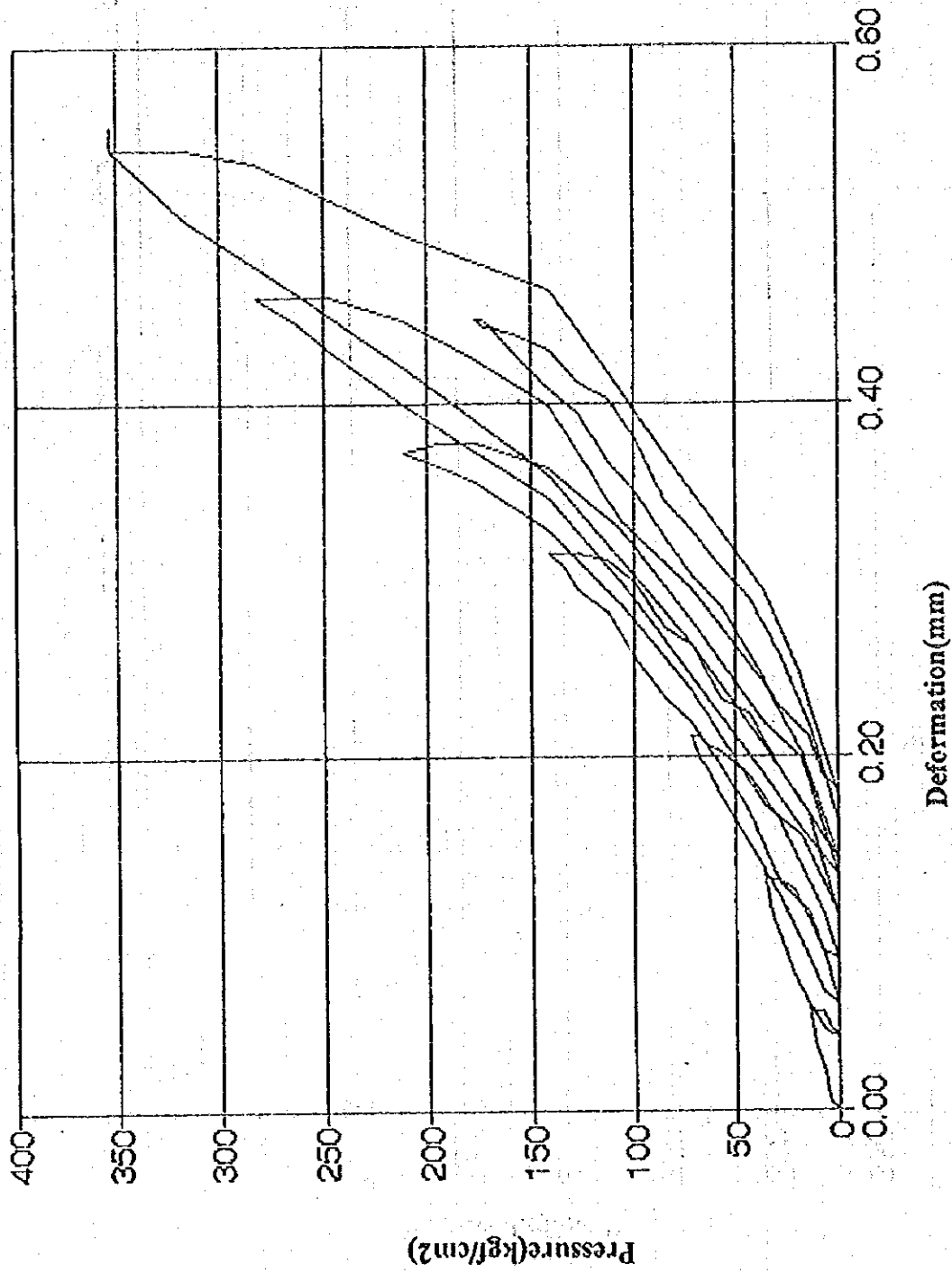


Fig.A-4-29 Deformation-Pressure Curve Deformation Test PHL18TP 10.3m Diagram was offered by ICE.

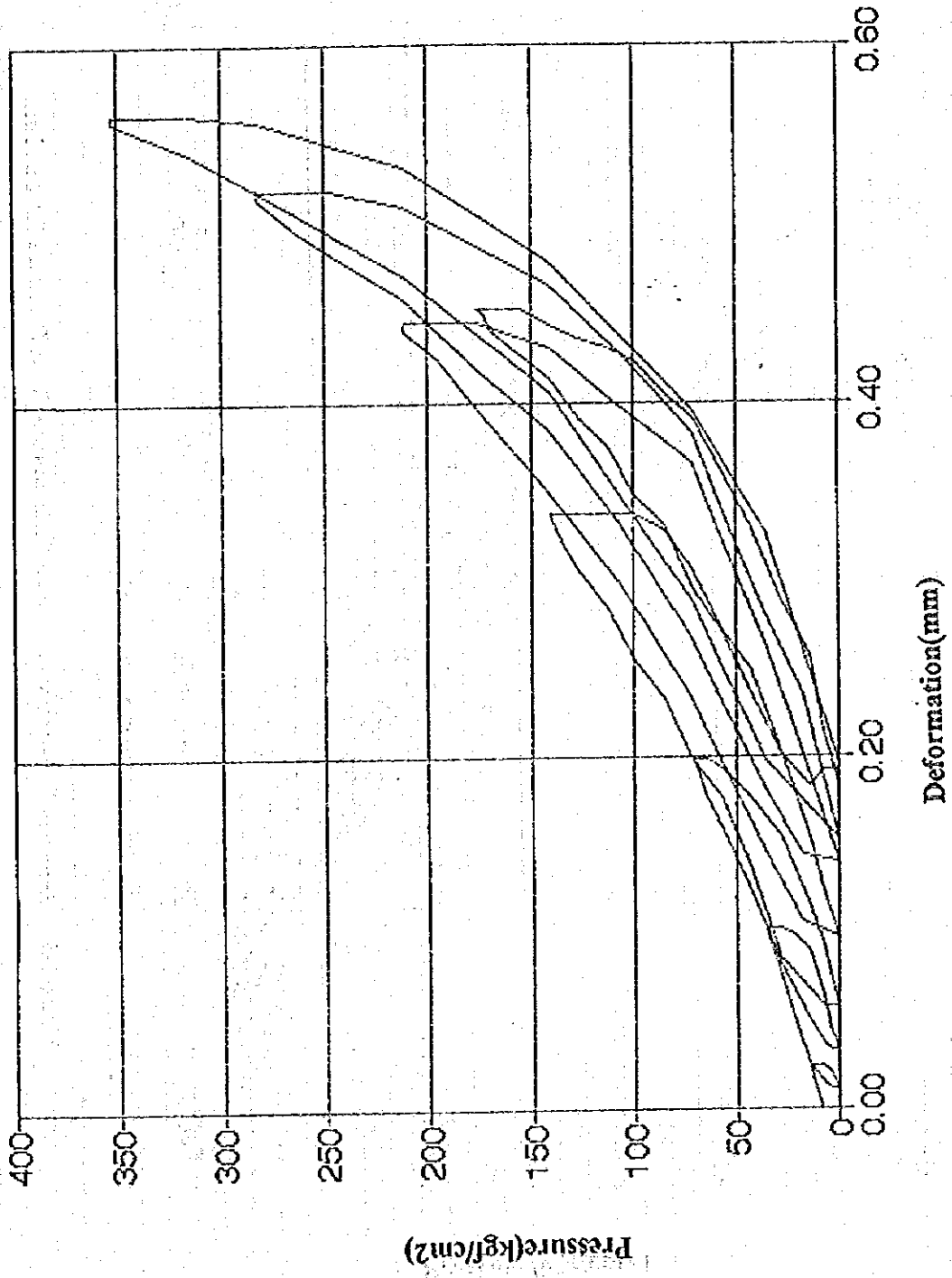


Fig-A-4-30 Deformation-Pressure Curve Deformation Test PELL18TP 10.5m

Diagram was offered by ICE.

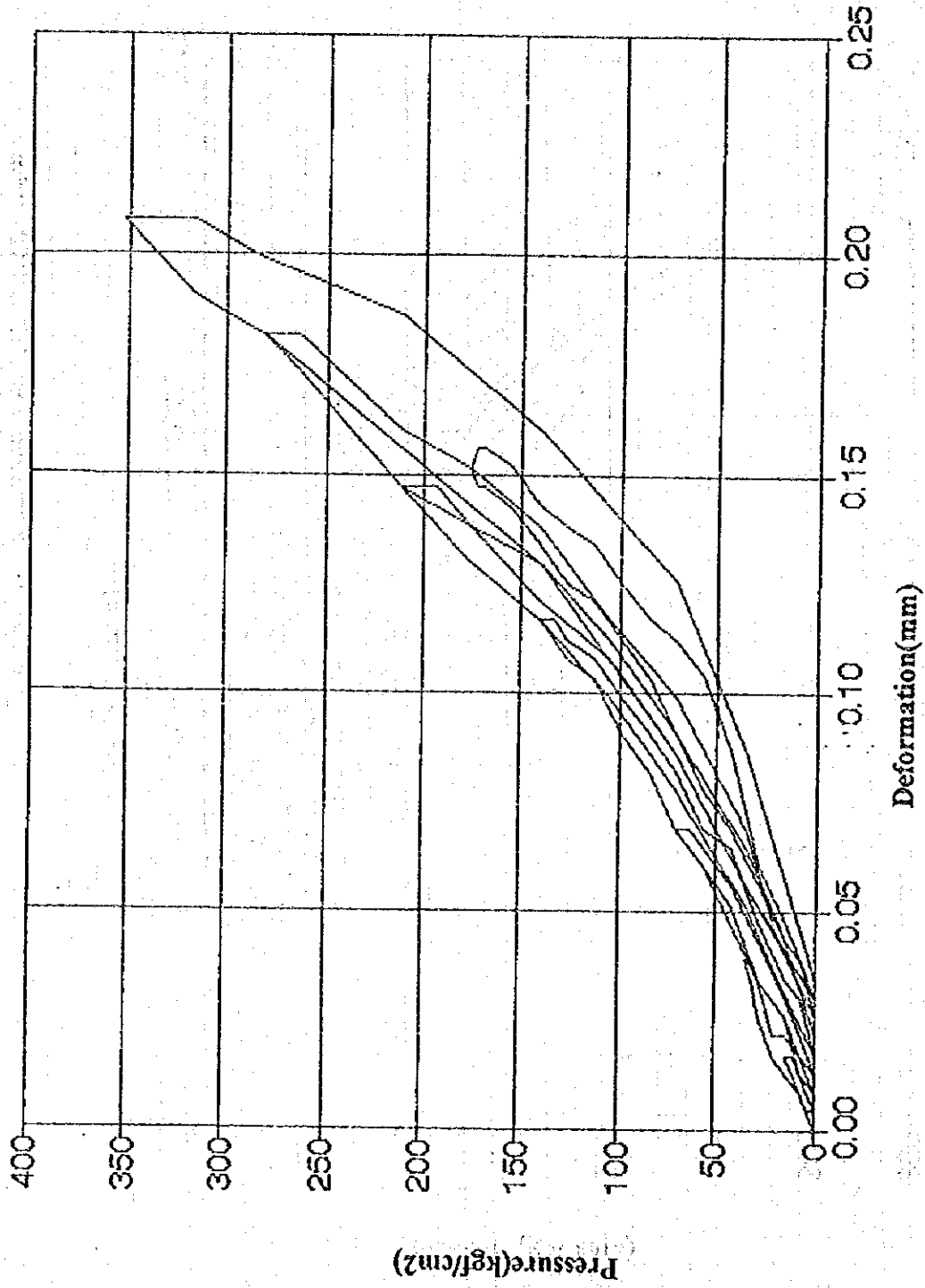


Fig-A-4-31 Deformation-Pressure Curve Deformation Test PHELL18TP 16.10m

Diagram was offered by ICE.