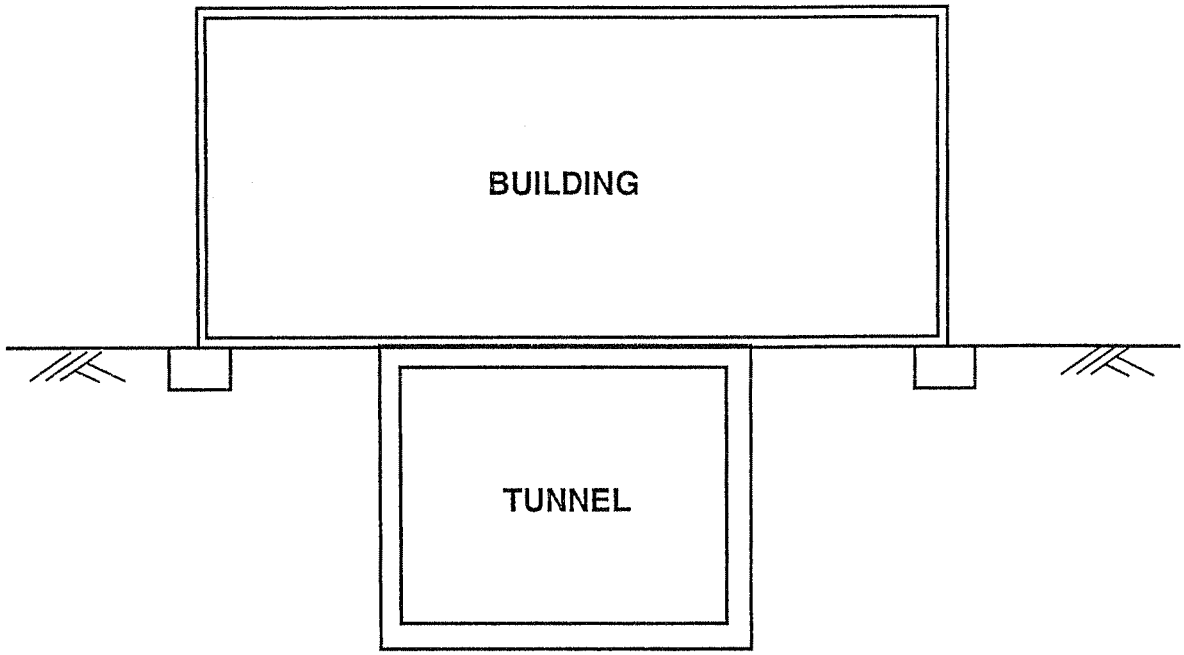
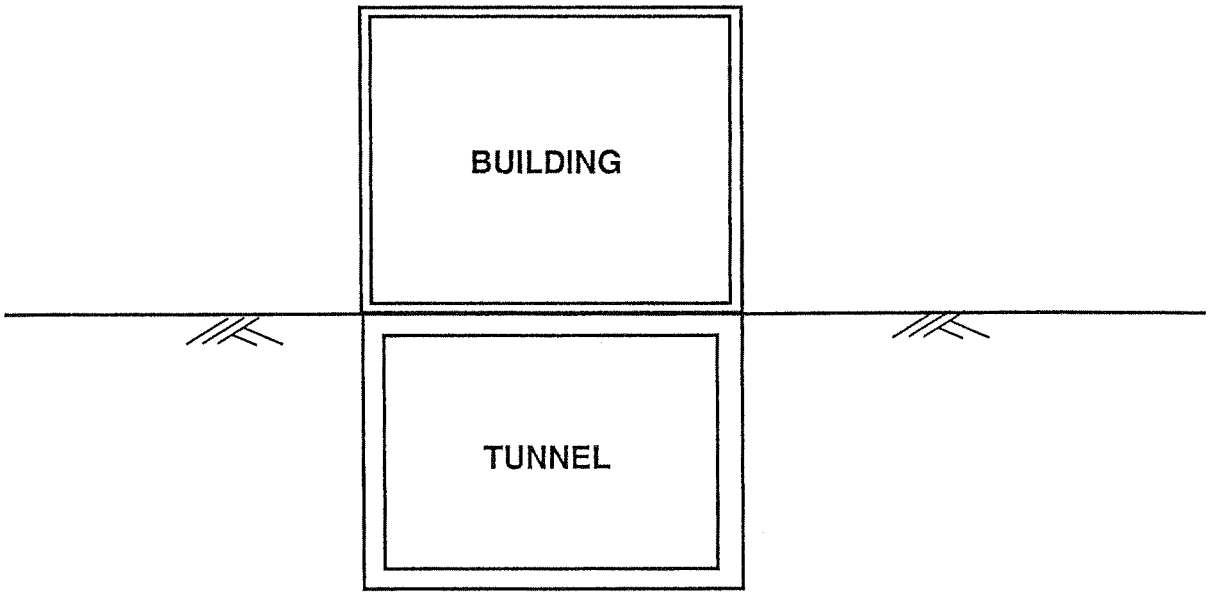
APPENDIX A

FIGURES



(a) Building Footprint Larger Than Tunnel Footprint



(b) Building Footprint Matches Tunnel Footprint

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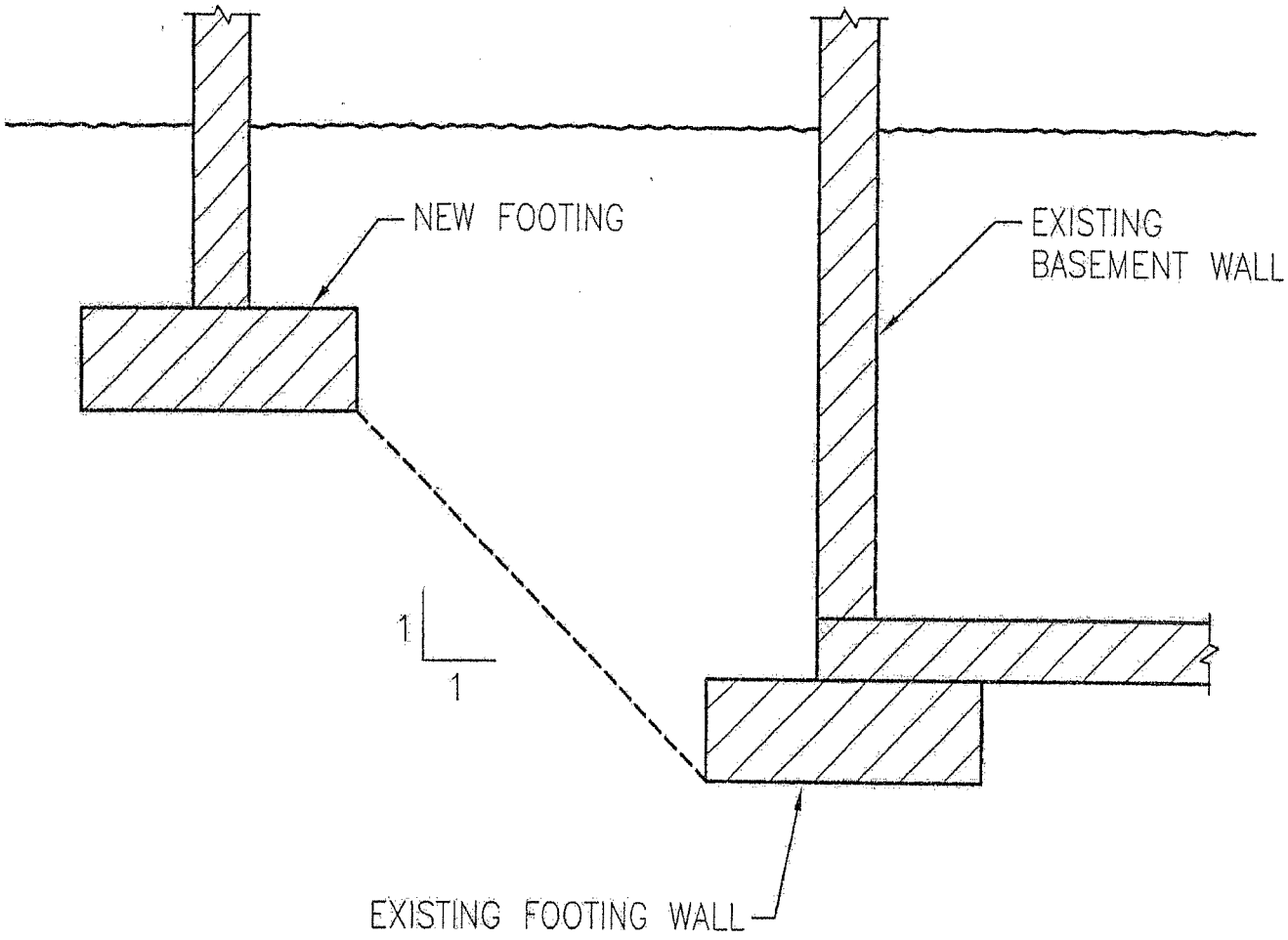
INTERFACE BETWEEN OVERLYING AND BURIED STRUCTURES

PROPOSED LCLS TUNNEL PROJECT

STANFORD LINEAR ACCELERATOR CENTER

MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	1	A1



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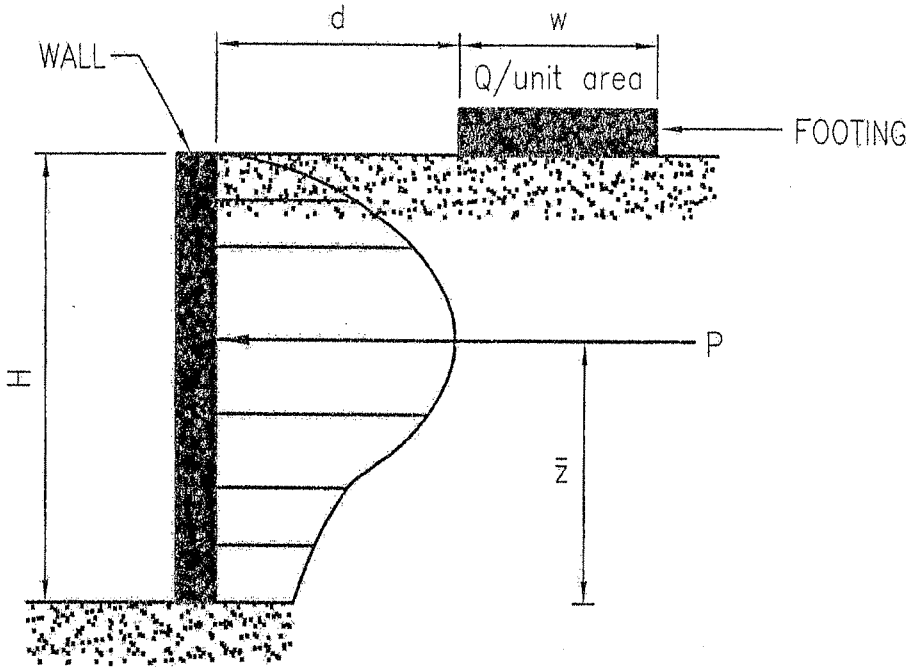
Criterion for Footings Bearing at Different Elevations
Proposed LCLS Tunnel Project
Stanford Linear Accelerator Center
Menlo Park, California

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	2	A2



The total force per unit length (P) and the location of the resultant force, $\bar{z}$, due to the strip loading only can be expressed as follows.

$$P = \frac{Q}{90}\ [H\ (\alpha_2 - \alpha_1)]$$

where $\alpha_1 = \tan^{-1}\left(\frac{d}{H}\right)$

$$\alpha_2 = \tan^{-1}\left(\frac{w + d}{H}\right)$$

$$H - \bar{z} = \frac{H^2(\alpha_2 - \alpha_1) - (R - Q) + 57.30\ wH}{2H(\alpha_2 - \alpha_1)}$$

where $R = (w + d)^2\,(90 - \alpha_2)$

$$Q = d^2(90 - \alpha_1)$$

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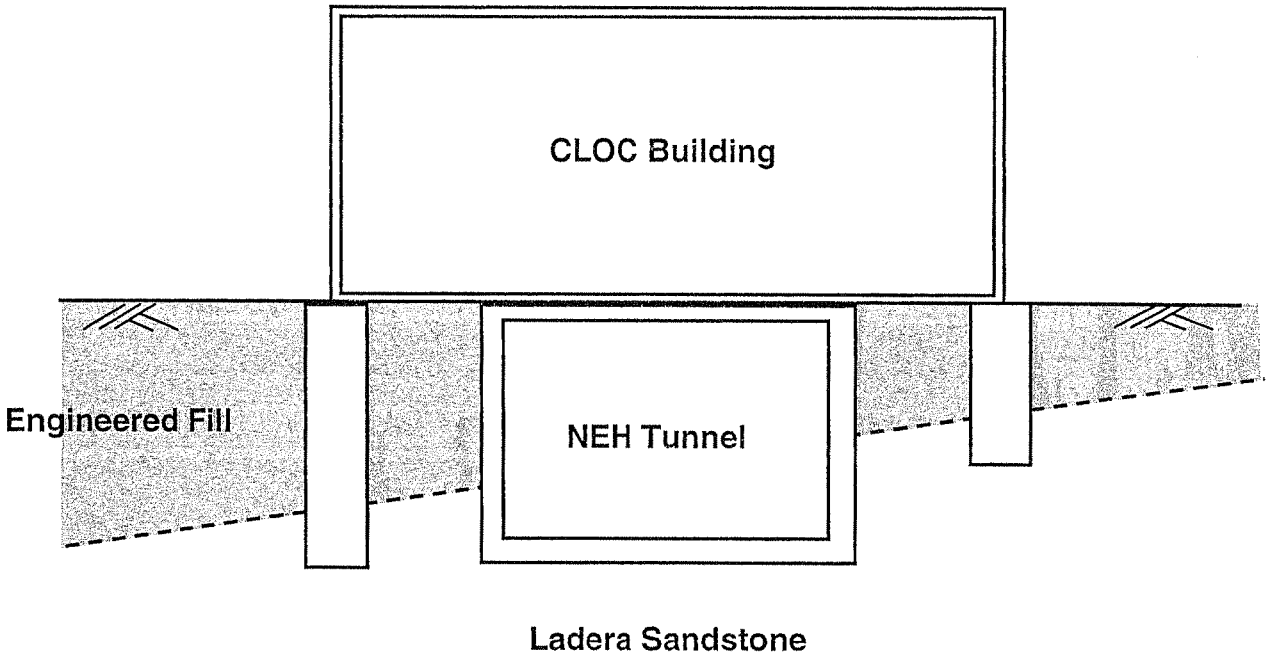
Surcharge on Walls Due to Nearby Footing
Proposed LCLS Tunnel Project
Stanford Linear Accelerator Center
Menlo Park, California

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	3	A3



Building Footings Extend Through the Engineered Fill and Bear on the Ladera Sandstone

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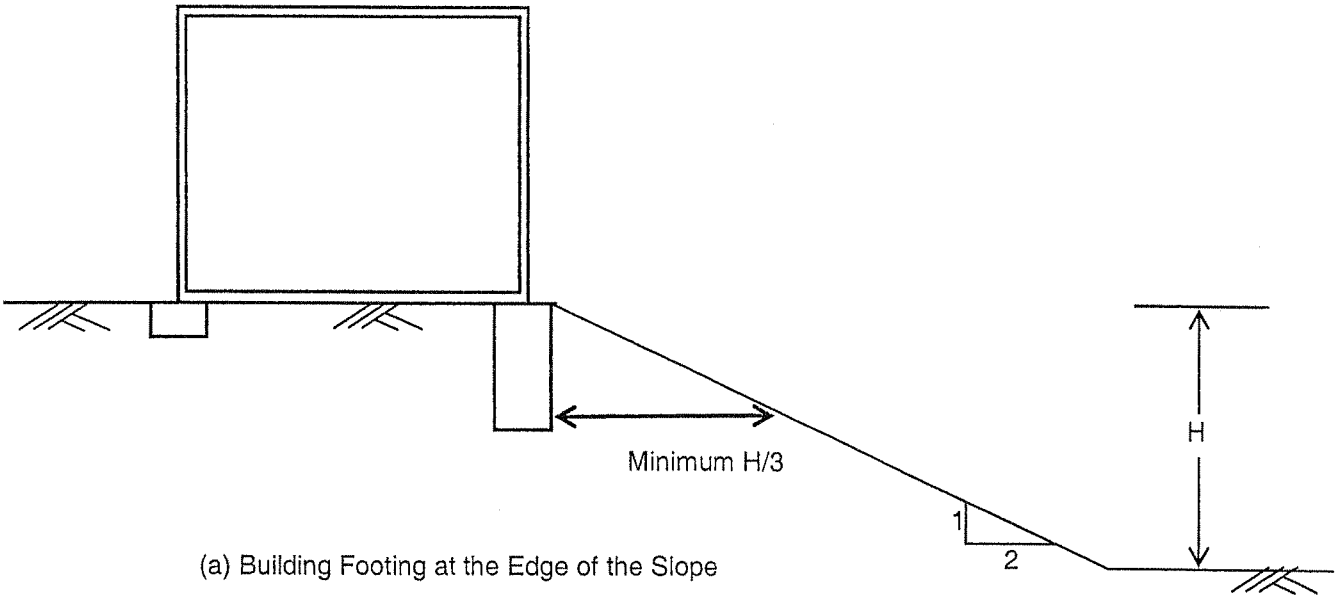
BUILDING UNDERLAIN BY VARIABLE THICKNESS OF ENGINEERED FILL

PROPOSED LCLS TUNNEL PROJECT

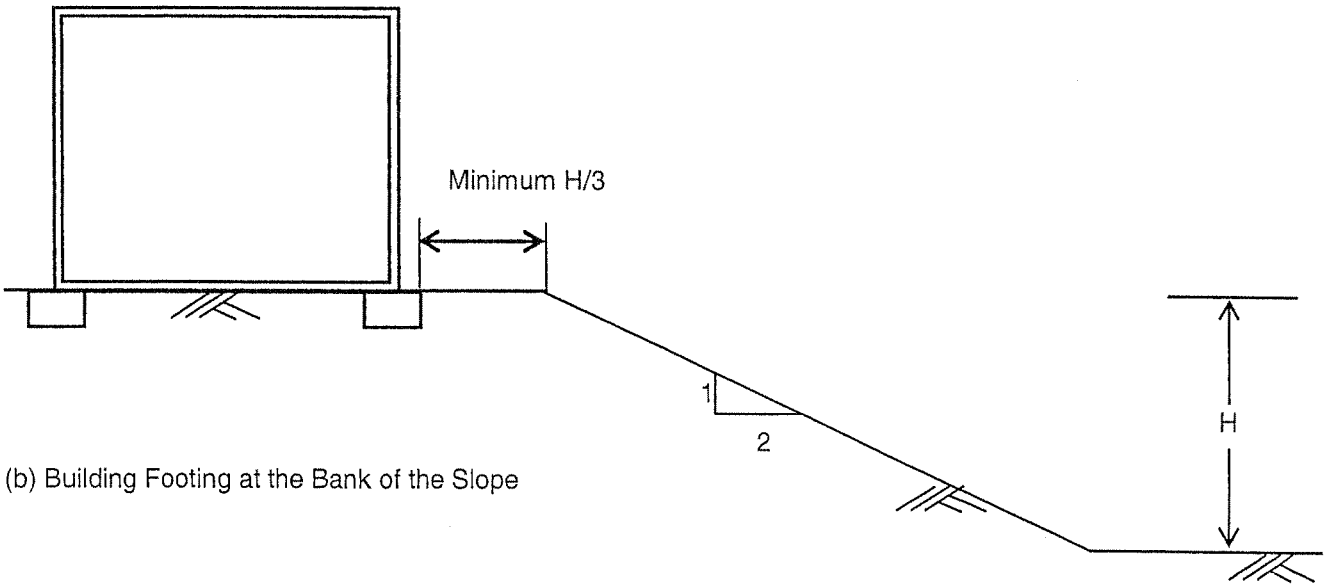
STANFORD LINEAR ACCELERATOR CENTER

MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	4	A4



(a) Building Footing at the Edge of the Slope



(b) Building Footing at the Bank of the Slope

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FOOTINGS ADJACENT TO SLOPE

PROPOSED LCLS TUNNEL PROJECT

STANFORD LINEAR ACCELERATOR CENTER

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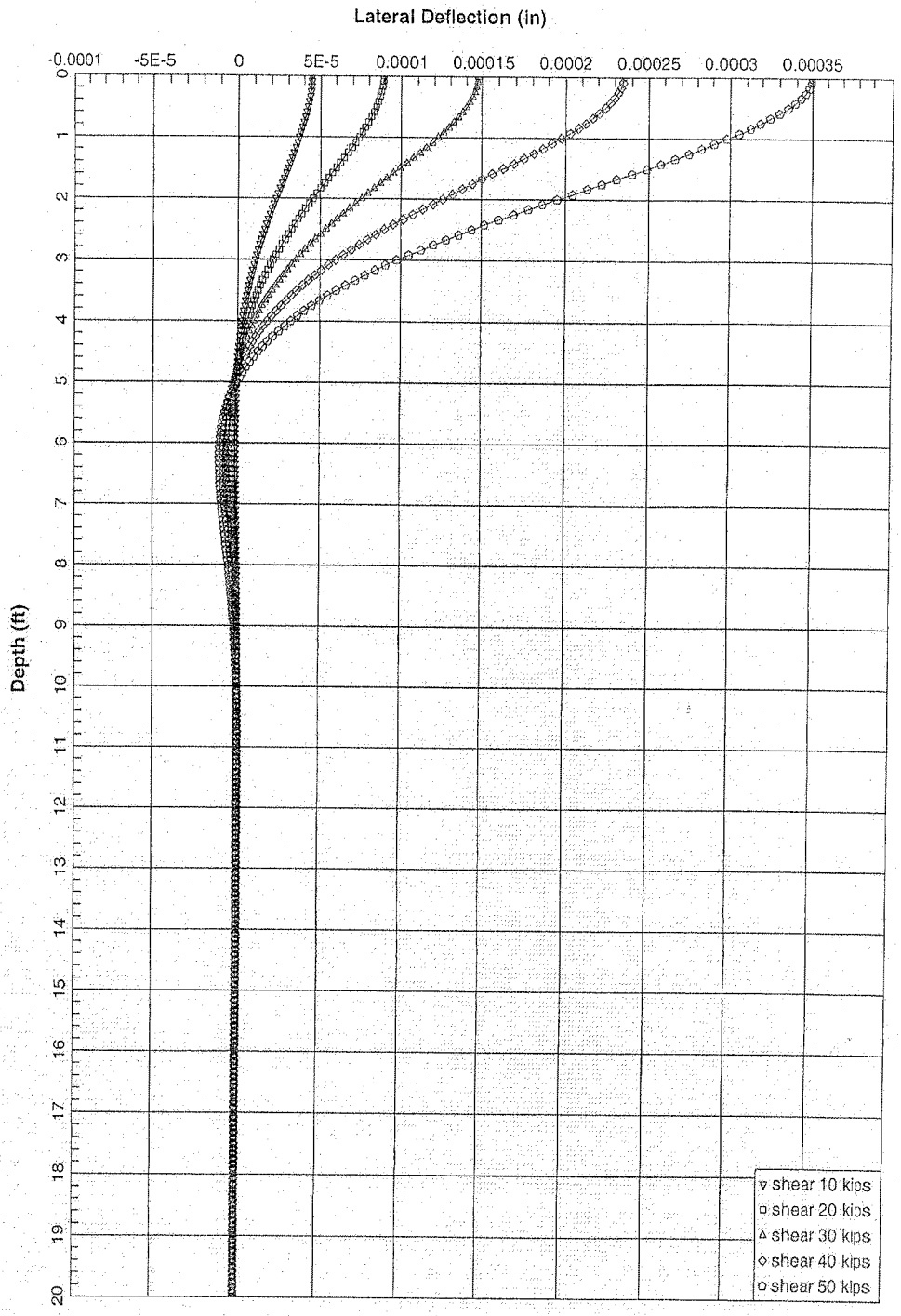
JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	5	A5



4-FOOT DIAMETER, 20-FOOT LONG DRILLED PIER
FIXED HEAD CONDITION

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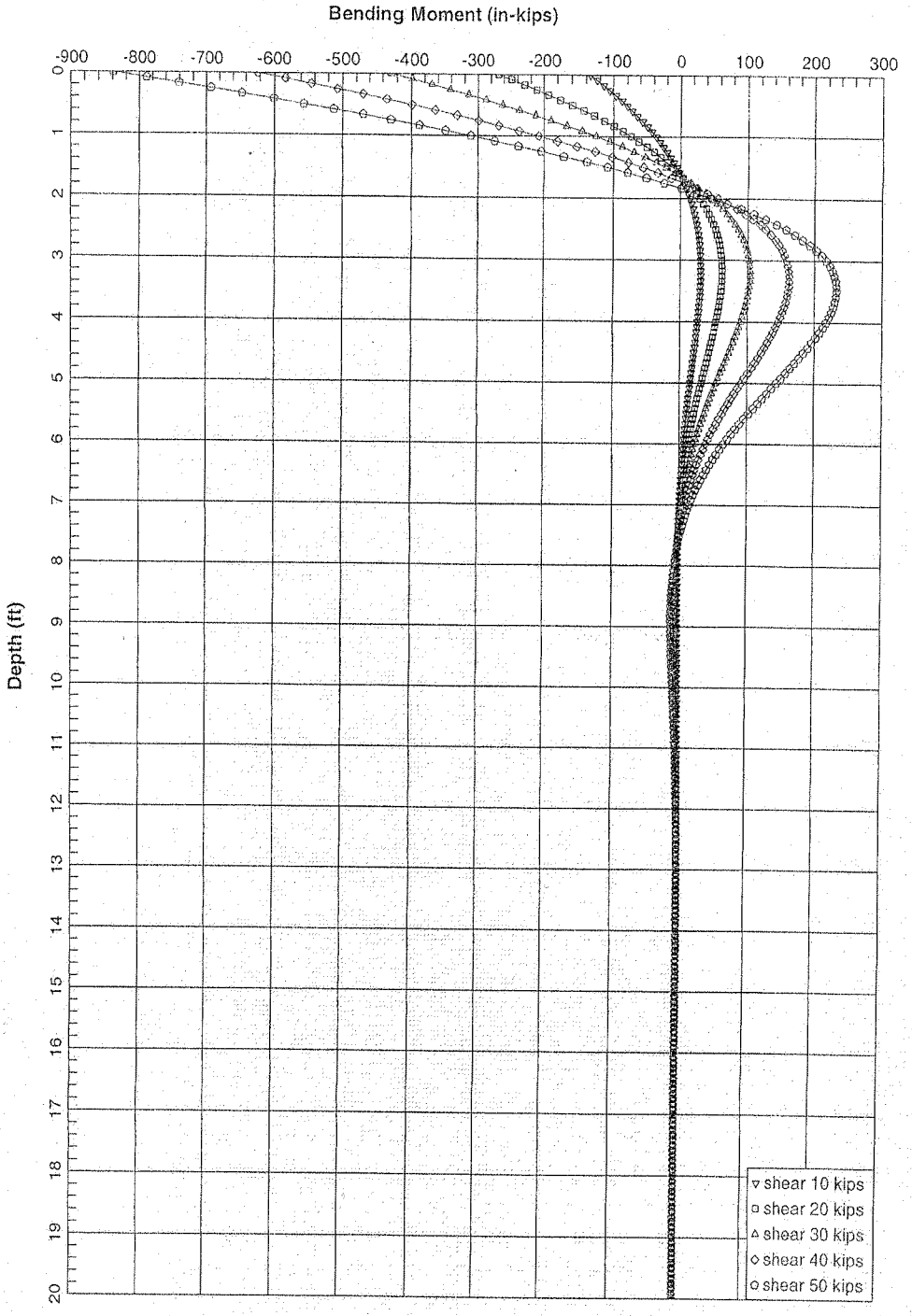
LATERAL DEFLECTION VS. DEPTH
PROPOSED LCLS TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	6	A6



4-FOOT DIAMETER, 20-FOOT LONG DRILLED PIER
FIXED HEAD CONDITION

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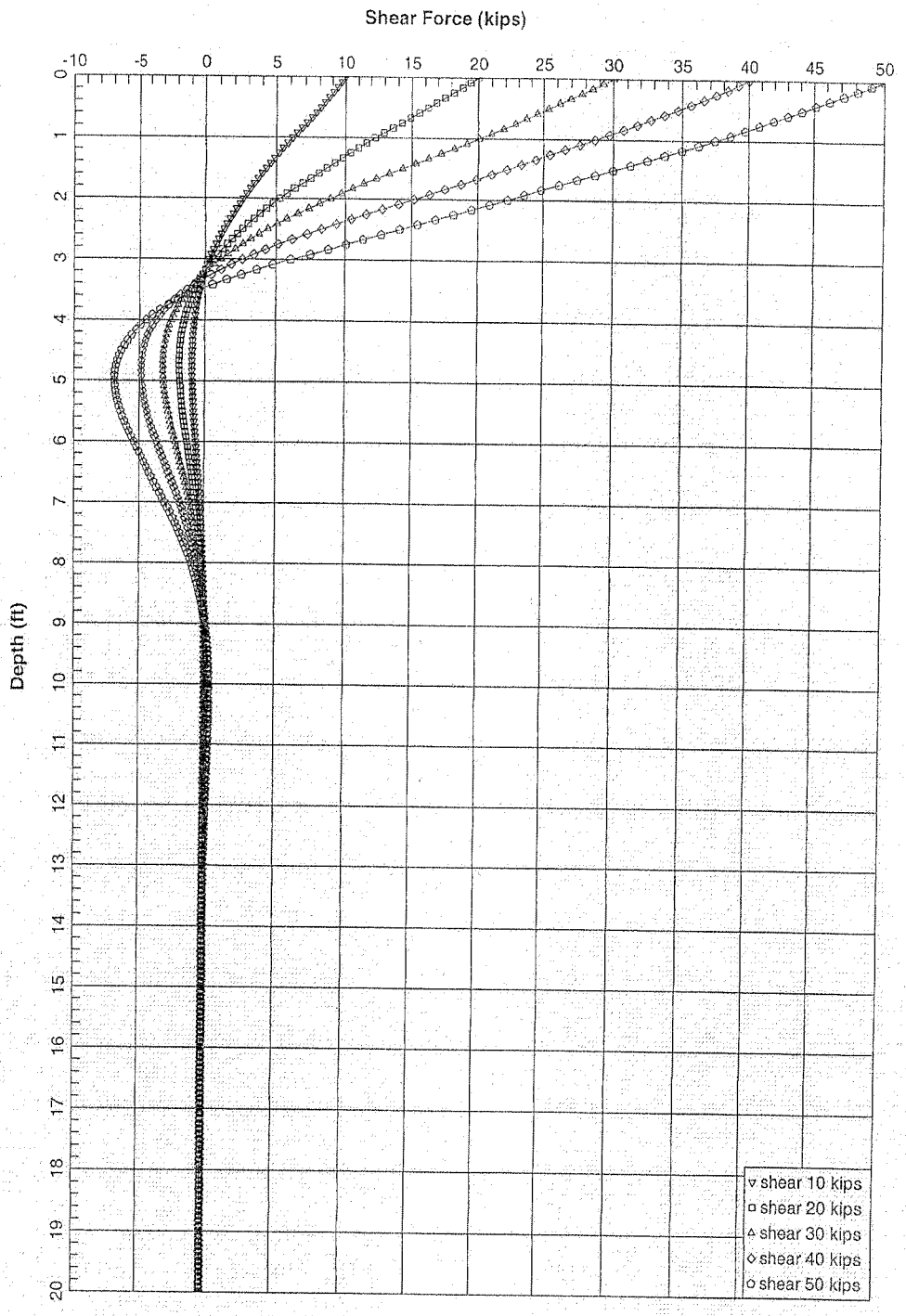
BENDING MOMENT VS. DEPTH
PROPOSED LCLS TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	7	A7



4-FOOT DIAMETER, 20-FOOT LONG DRILLED PIER
FIXED HEAD CONDITION

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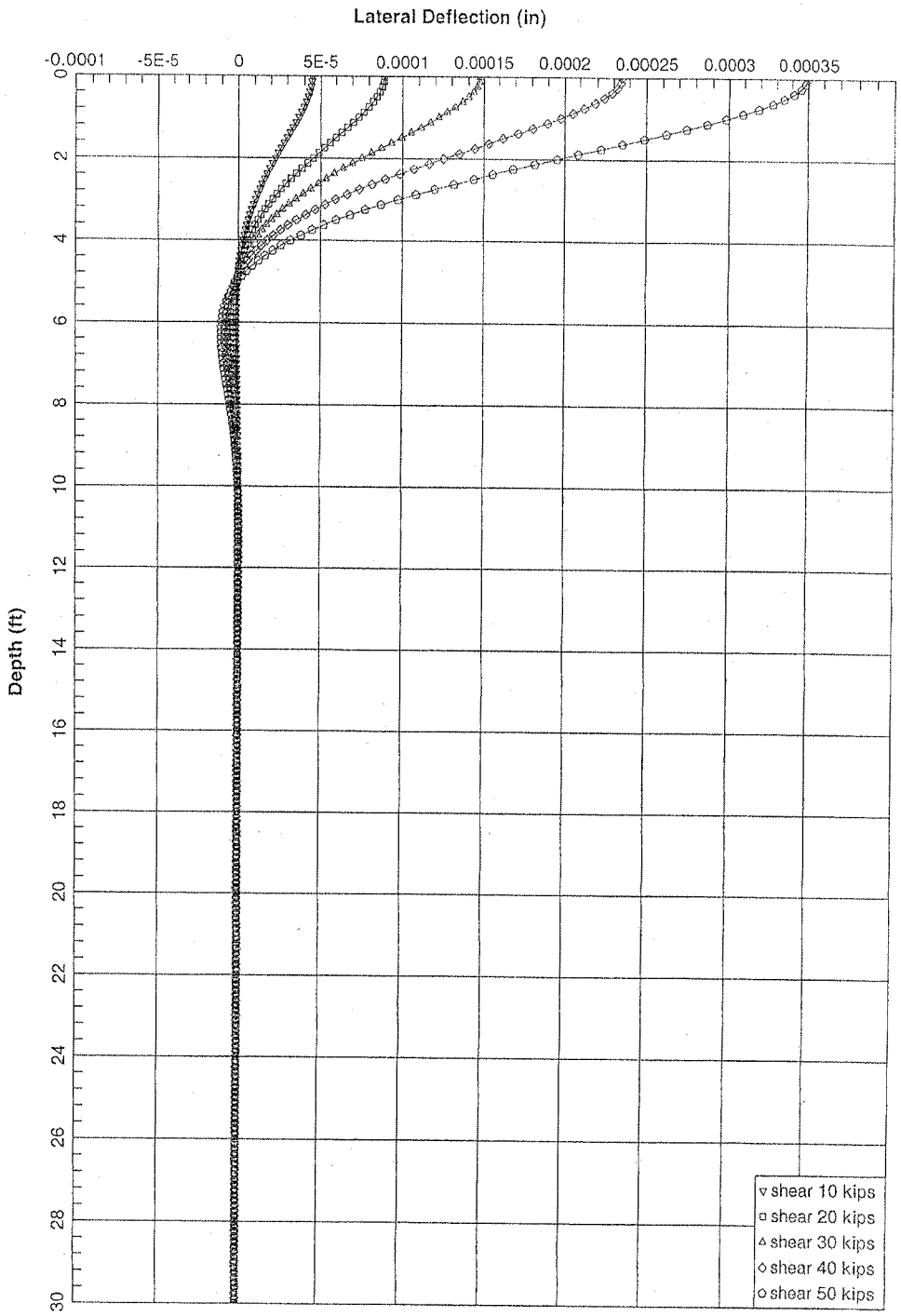
SHEAR FORCE VS. DEPTH
PROPOSED LCLS TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	8	A8



4-FOOT DIAMETER, 30-FOOT LONG DRILLED PIER
FIXED HEAD CONDITION

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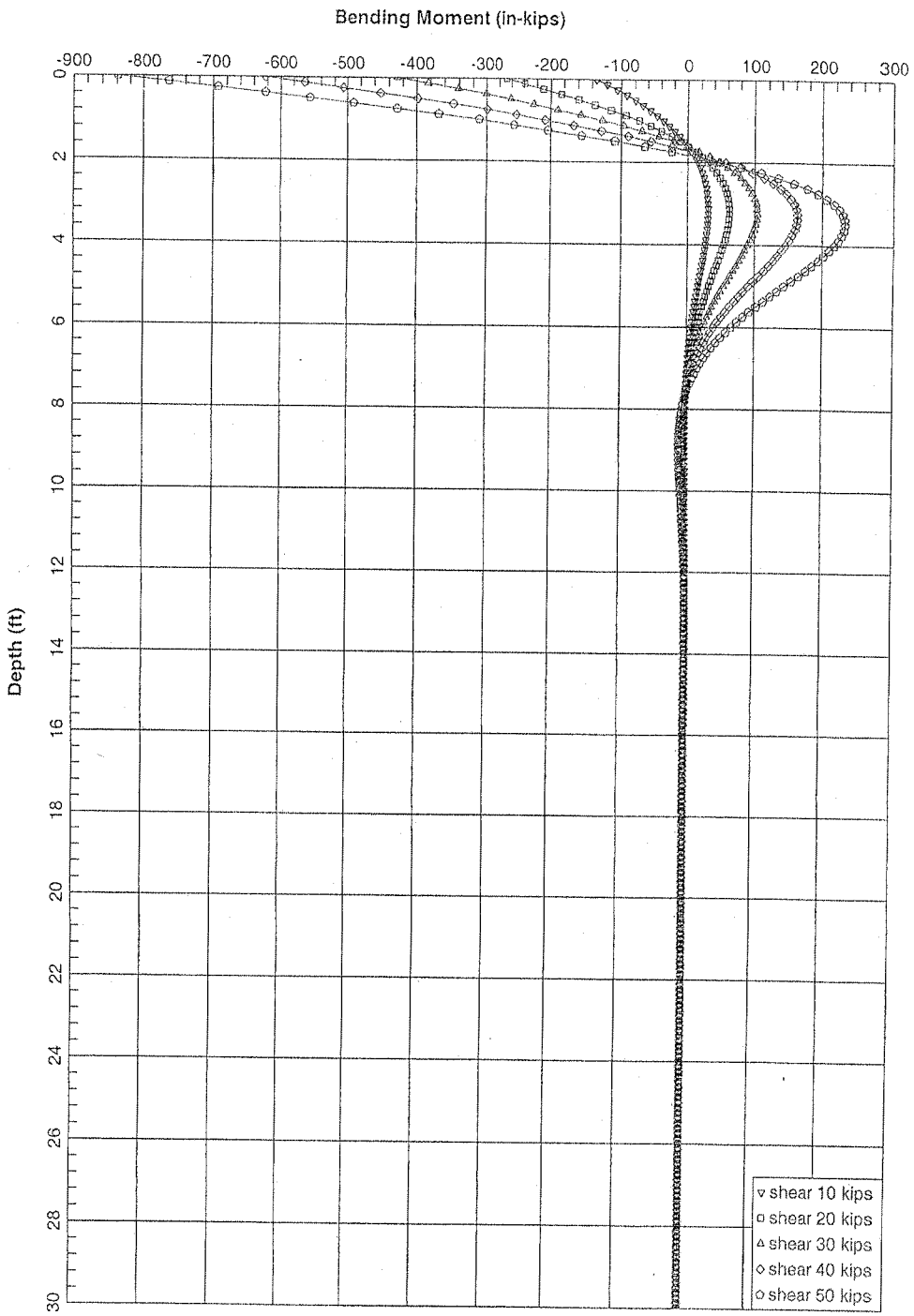
LATERAL DEFLECTION VS. DEPTH
PROPOSED LCLS TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	9	A9



4-FOOT DIAMETER, 30-FOOT LONG DRILLED PIER
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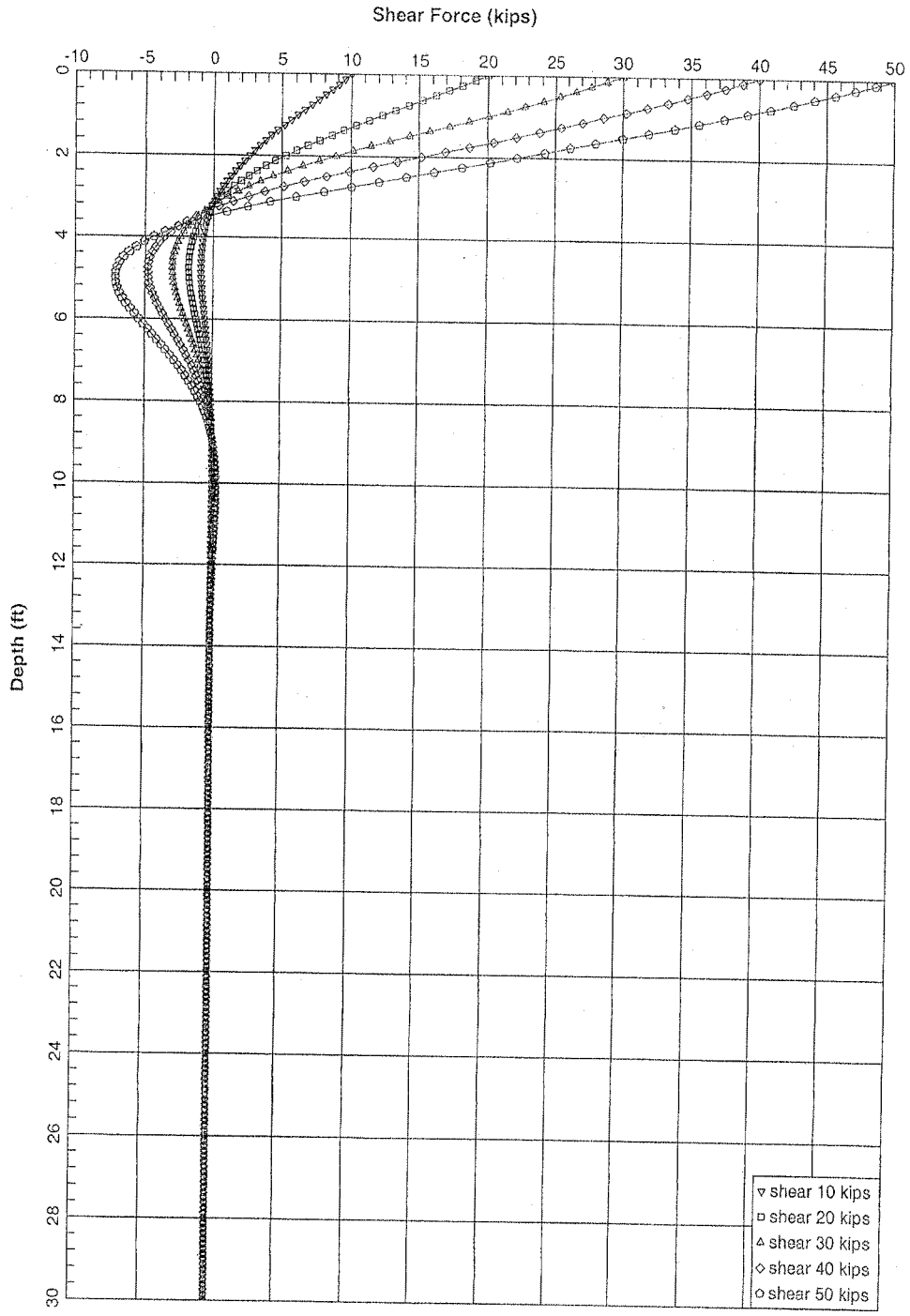
BENDING MOMENT VS. DEPTH
PROPOSED LCLS TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	10	A10



4-FOOT DIAMETER, 30-FOOT LONG DRILLED PIER
FIXED HEAD CONDITION

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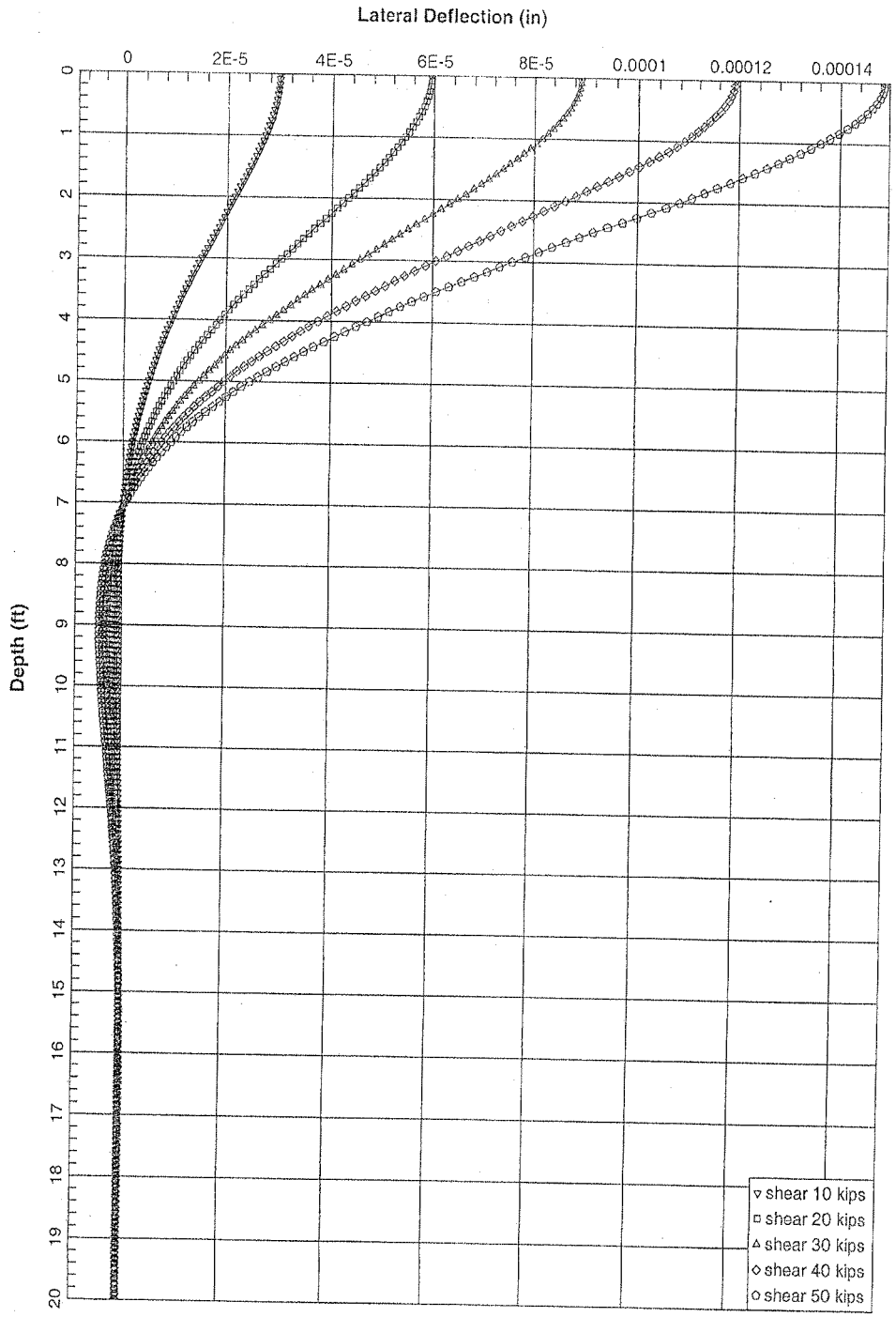
SHEAR FORCE VS. DEPTH
PROPOSED LCLS TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
MENLO PARK, CALIFORNIA

JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	11	A11



6-FOOT DIAMETER, 20-FOOT LONG DRILLED PIER
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LATERAL DEFLECTION VS. DEPTH
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JOB NUMBER	DATE	FIGURE	PAGE
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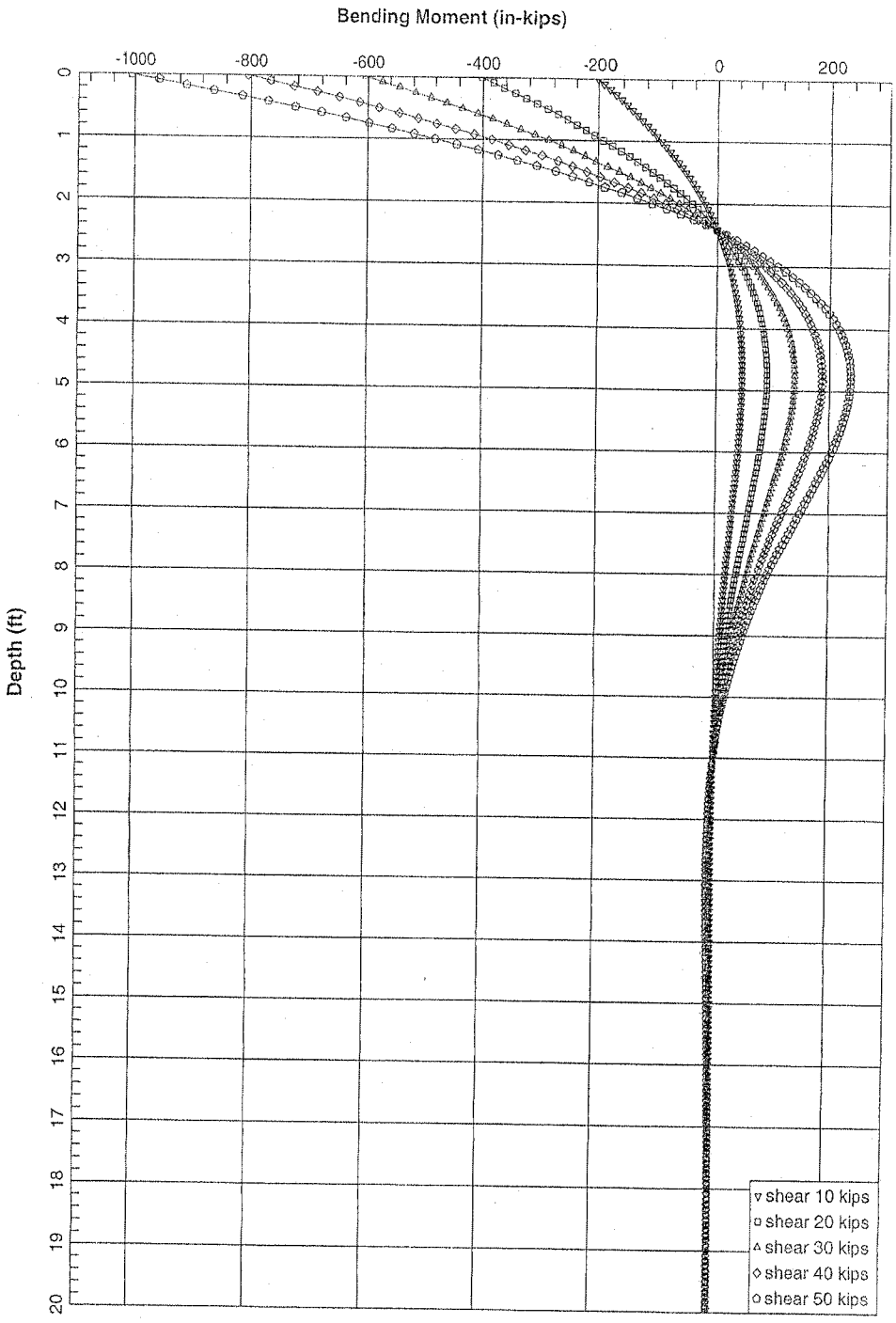

6-FOOT DIAMETER, 20-FOOT LONG DRILLED PIER
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BENDING MOMENT VS. DEPTH
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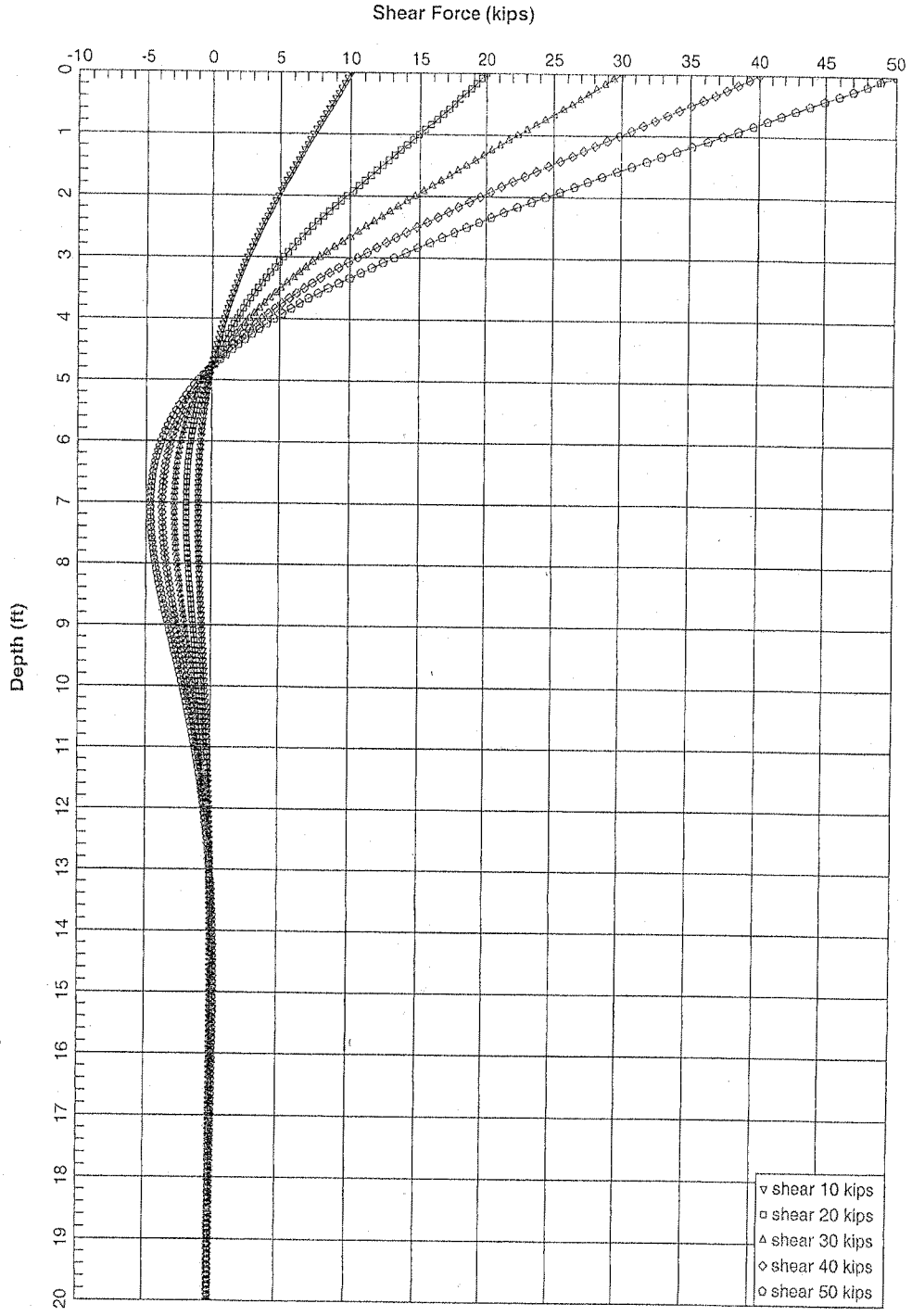
JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	13	A13



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SHEAR FORCE VS. DEPTH
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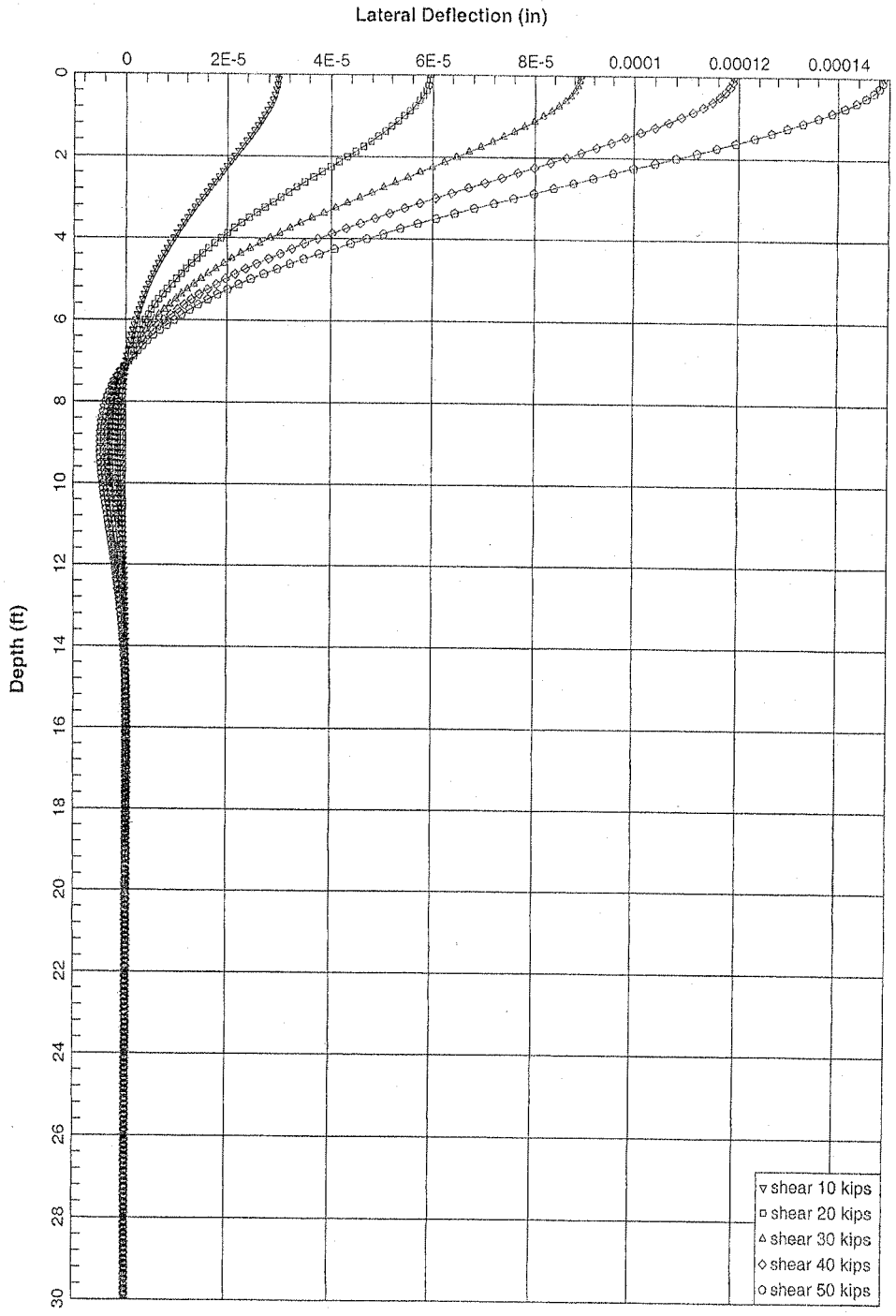
JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	14	A14



6-FOOT DIAMETER, 30-FOOT LONG DRILLED PIER
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LATERAL DEFLECTION VS. DEPTH
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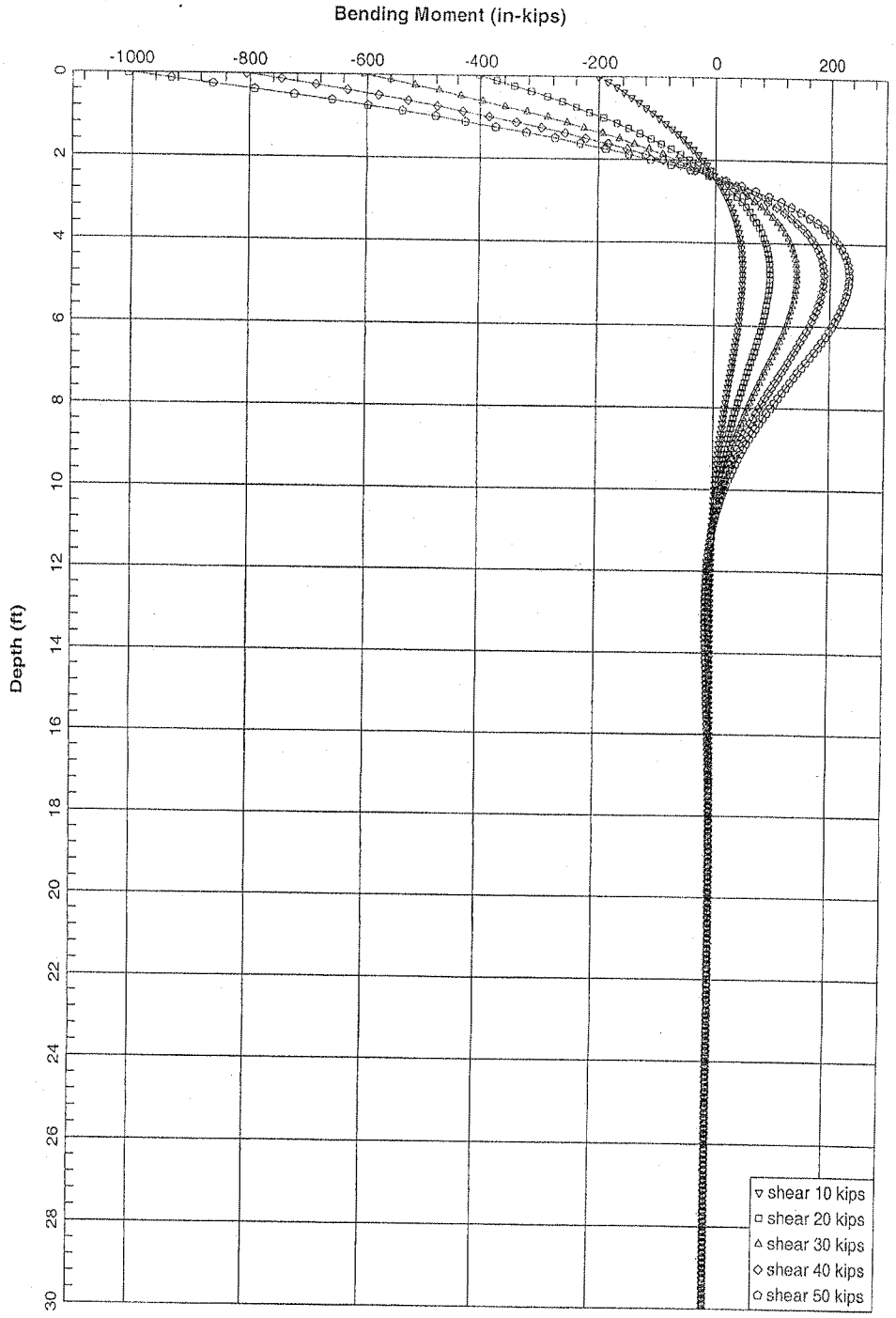
JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	15	A15



6-FOOT DIAMETER, 30-FOOT LONG DRILLED PIER
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BENDING MOMENT VS. DEPTH
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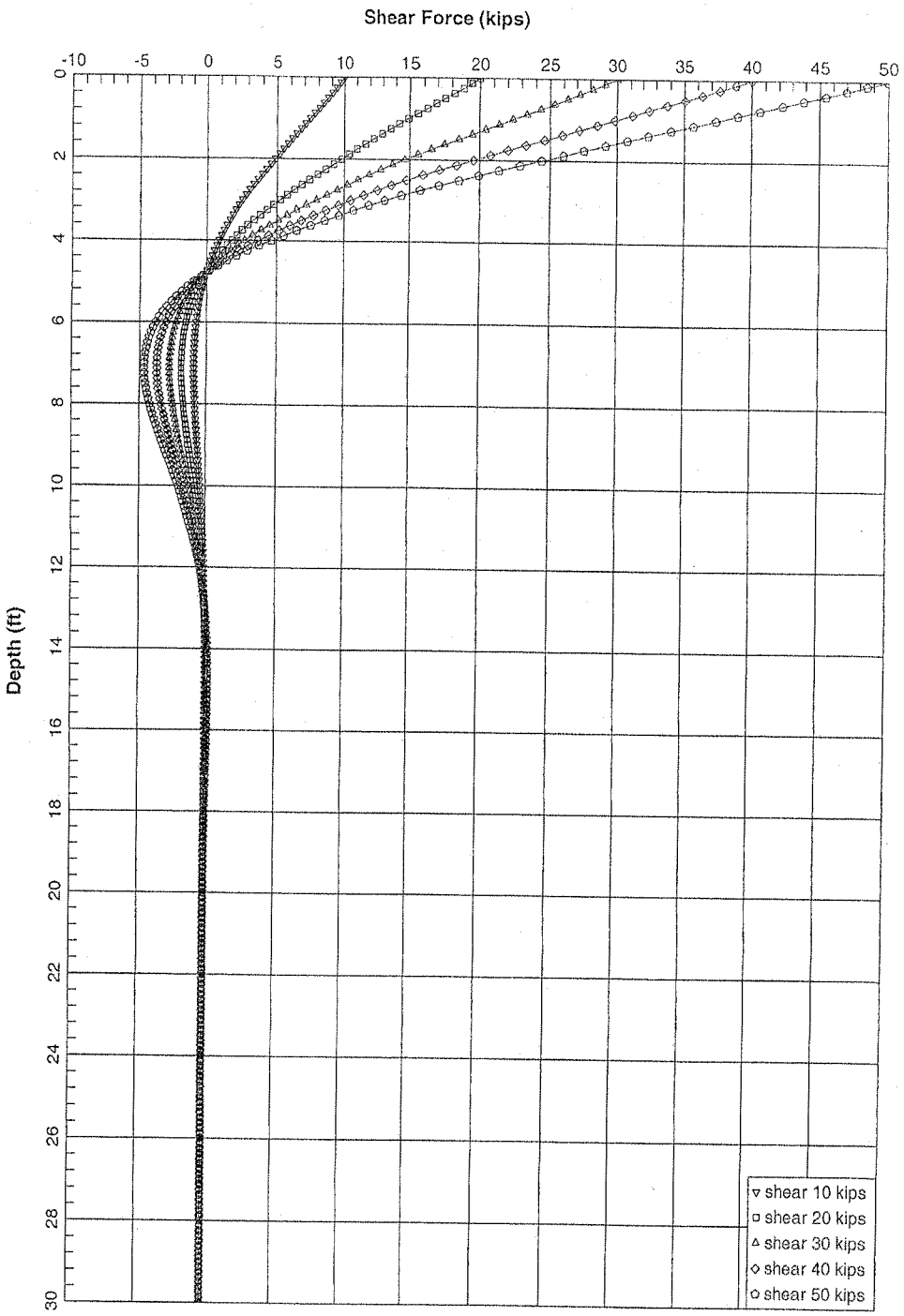
JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	16	A16



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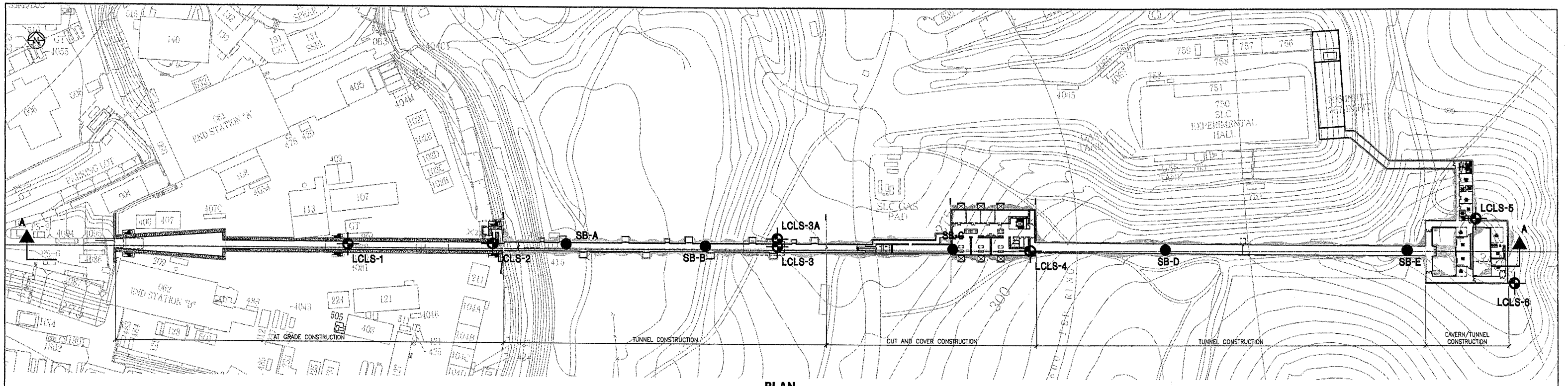
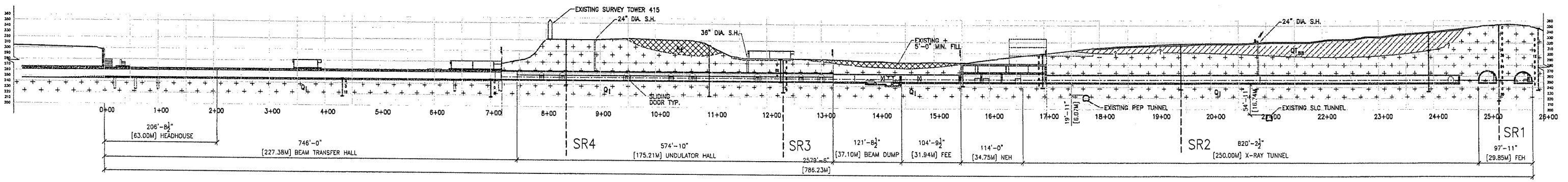
JOB NUMBER	DATE	FIGURE	PAGE
2003-060G2	1/21/2005	17	A17



PLAN



PROFILE

LEGEND FOR PLAN:

- SB-A — BORING LOCATION – 2003 GEOTECHNICAL STUDY
- LCLS-1 — BORING LOCATION – CURRENT GEOTECHNICAL INVESTIGATION

LEGEND FOR PROFILE:

- ARTIFICIAL FILL: POORLY CONSOLIDATED TO WELL – CONSOLIDATED GRAVEL SAND, SILT AND ROCK FRAGMENTS IN VARIOUS COMBINATIONS.
- RESIDUAL SOIL: MIXTURE OF SAND, SILT AND CLAY.
- SANTA CLARA FORMATION (LOWER PLEISTOCENE AND UPPER PLEISTOCENE): POORLY SORTED, POORLY CONSOLIDATED FLUVIAL DEPOSITS OF GRAVEL, SAND SILT AND CLAY. COMPOSED LARGELY OF GREYWACKE DEBRIS AND BOULDERS.
- LADER A SANDSTONE (UPPER AND MIDDLE MIOCENE): PREDOMINANTLY GRAYISH YELLOW TO MODERATE YELLOW, CLEAN, WELL SORTED, MEDIUM – TO FINE – GRAINED SANDSTONE. THE LADERA SANDSTONE IS TYPICALLY 1000 – 1500 FT. THICK.

PROFILE

- RQD AT 10 FEET INTERVALS FOR LCLS-1 THRU LCLS-6. REFER TO BORINGS FOR DETAILED RQD.
- BORING PROFILE
- LOCATION OF SUBSURFACE PROFILE FOR SITE RESPONSE ANALYSIS

SR1

0 100' 200' 400'

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SUBSURFACE PROFILES FOR SITE RESPONSE ANALYSIS
LINAC COHERENT LIGHT SOURCE TUNNEL PROJECT
STANFORD LINEAR ACCELERATOR CENTER
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JOB No.2003-060G2	DATE: 1/21/05	FIGURE: 18	PAGE: A18