

RO 251

**Hwang, Don, Env. Health**

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**From:** Woodburne, Keith [kwoodburne@TRCSOLUTIONS.com]  
**Sent:** Wednesday, December 14, 2005 11:30 AM  
**To:** Hwang, Don, Env. Health  
**Subject:** Boring logs for site 3538 Oakland  
**Attachments:** 3538 Well Boring Logs.pdf

Don,

Here's another pdf of the boring logs for site 3538 Oakland. Let me know if you cannot open the file. If not, I can also fax you the logs. What's your fax number?

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12/15/2005

**B O R I N G   L O G**

<b>Project No.</b> KEI-P89-0703	<b>Boring &amp; Casing Diameter</b> 9"                      2"	<b>Logged By</b> D.L.
<b>Project Name</b> Unocal, Oakland/MacArthur	<b>Well Head Elevation</b> N/A	<b>Date Drilled</b> 9/7/89
<b>Boring No.</b> MW1	<b>Drilling Method</b> Hollow-stem Auger	<b>Drilling Company</b> EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Strati- graphy USCS	Description
		0		A.C. Pavement Sand and Gravel: fill.
11/17/22		5		Clay, high plasticity, stiff, moist, very dark grayish brown.
				-----
32/17/20		10		Gravelly clay with sand, stiff, moist, dark yellowish brown. Sand clay, high plasticity, stiff, moist, olive, trace gravel.
			CH	Clay, high plasticity, very stiff, moist, pale olive, with greenish gray stained root holes.
13/17/19		15		Sandy clay, moderate to high plasticity, stiff, moist, olive to light yellowish brown.
10/17/20	▼			
		20	SC	Clayey sand, dense, very moist to wet, yellowish brown.

**B O R I N G   L O G**

<b>Project No.</b> KEI-P89-0703		<b>Boring &amp; Casing Diameter</b> 9"                      2"		<b>Logged By</b> D.L.
<b>Project Name</b> Unocal, Oakland/MacArthur		<b>Well Head Elevation</b> N/A		<b>Date Drilled</b> 9/7/89
<b>Boring No.</b> MW1		<b>Drilling Method</b>	Hollow-stem Auger	<b>Drilling Company</b> EGI
Penetra- tion blows/6"	G. W. level	Depth (ft) Samples	Strati- graphy USCS	Description
			SC	Clayey sand, as above.
		25	SP	Poorly graded sand, yellowish brown.
			CH	Clay, high plasticity, very stiff, moist, yellowish brown.
		30		
		35		
		40		
				<b>TOTAL DEPTH 29'</b>

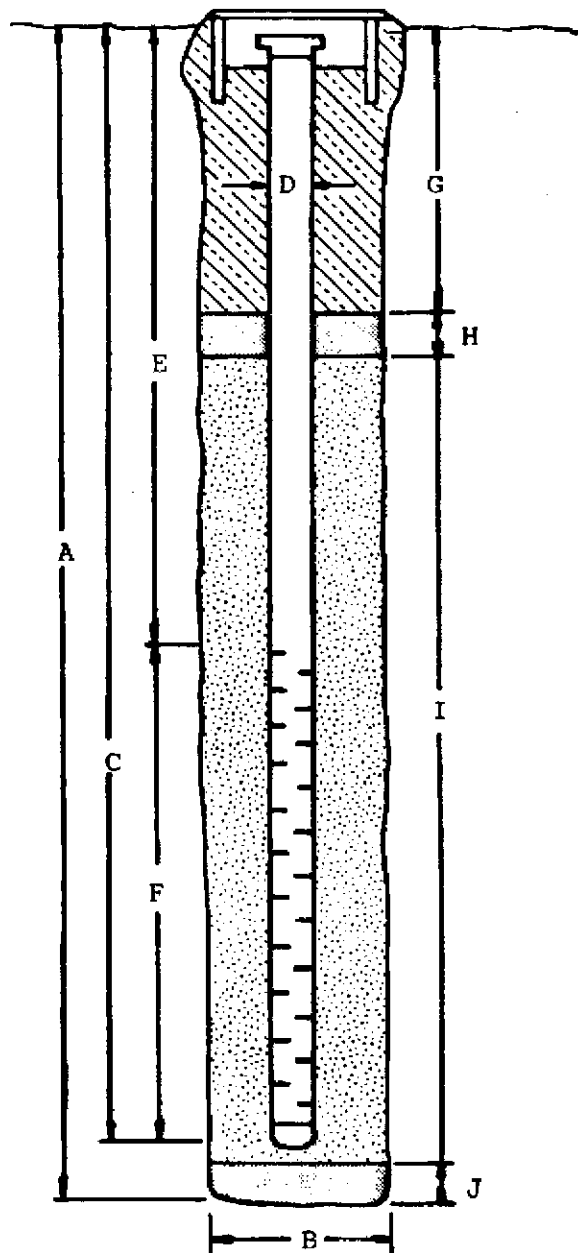
**W E L L   C O M P L E T I O N   D I A G R A M**

PROJECT NAME: Unocal - Oakland, MacArthur      BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.: \_\_\_\_\_

Flush-mounted Well Cover



A. Total Depth: 29'

B. Boring Diameter\*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 29'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"  
ID = 2.067"

E. Depth to Perforations: 5'

F. Perforated Length: 24'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 25'

Pack Material: RMC Lonestar Sand


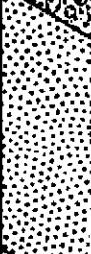

Size: #3

J. Bottom Seal: None

Seal Material: N/A

\*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

**B O R I N G   L O G**

<b>Project No.</b> KEI-P89-0703		<b>Boring &amp; Casing Diameter</b> 9"                      2"		<b>Logged By</b> D.L.	
<b>Project Name</b> Unocal, Oakland/MacArthur		<b>Well Head Elevation</b> N/A		<b>Date Drilled</b> 9/6/89	
<b>Boring No.</b> MW2		<b>Drilling Method</b> Hollow-stem Auger		<b>Drilling Company</b> EGI	
<b>Penetra- tion blows/6"</b>	<b>G. W. level</b>	<b>Depth (ft) Samples</b>	<b>Strati- graphy USCS</b>	<b>Description</b>	
			GP- GM		Poorly graded gravel with silt and sand, very dense, wet, dark yellowish brown.
25/37/45		25	GP		Poorly graded gravel with sand, very dense, wet, dark, yellowish brown.
25/29/35		30	CH		Clay, high plasticity, trace sand, very stiff, moist, yellowish brown.
		35			
		40			
					<b>TOTAL DEPTH 30.5'</b>

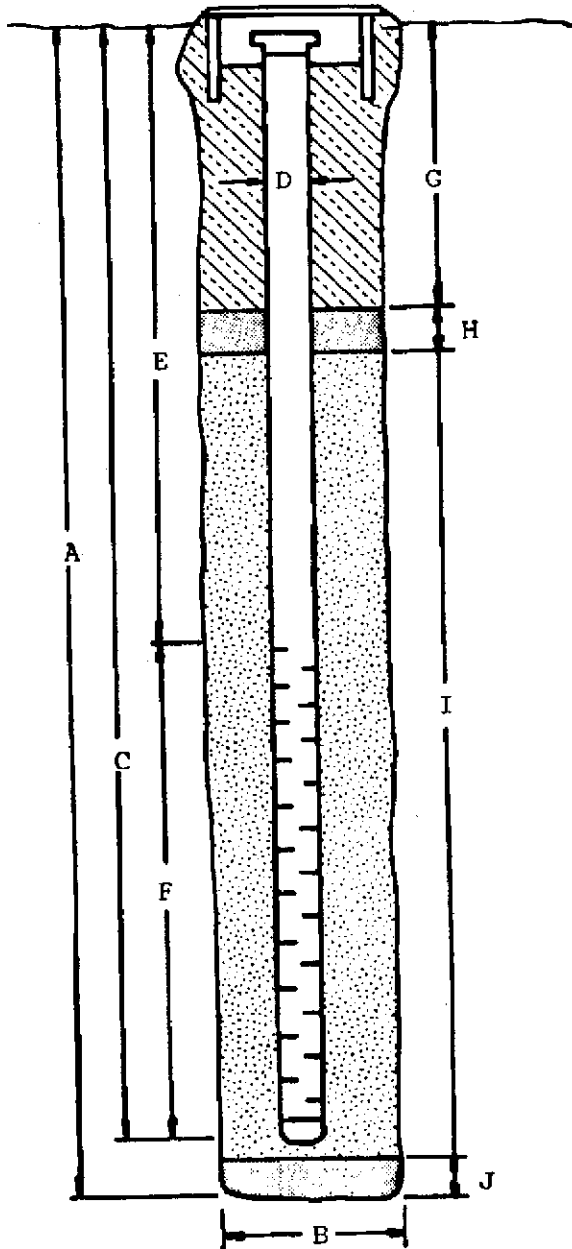
## W E L L   C O M P L E T I O N   D I A G R A M

PROJECT NAME: Unocal - Oakland, MacArthur BORING/WELL NO. MW2

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.: \_\_\_\_\_

Flush-mounted Well Cover



- A. Total Depth: 30'
- B. Boring Diameter\*: 9"  
Drilling Method: Hollow Stem Auger
- C. Casing Length: 28.5'  
Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"  
ID = 2.067"
- E. Depth to Perforations: 3.5'
- F. Perforated Length: 25'  
Perforation Type: Machined Slot  
Perforation Size: 0.020"
- G. Surface Seal: 2'  
Seal Material: Concrete
- H. Seal: 1'  
Seal Material: Bentonite
- I. Gravel Pack: 27'  
Pack Material: RMC Lonestar Sand  
Size: #3
- J. Bottom Seal: None  
Seal Material: N/A

\*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

**B O R I N G   L O G**

Project No. KEI-P89-0703	Boring & Casing Diameter 9"                      2"	Logged By D.L.
Project Name Unocal, Oakland/MacArthur	Well Head Elevation N/A	Date Drilled 9/7/89
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Strati- graphy USCS	Description
		0		Concrete Pavement
9/15/21		5	CH	Clay, high plasticity, with silt, stiff, moist, dark olive gray, very dark grayish brown above 4'.
14/17/23		10		Clay, high plasticity, very stiff, moist, pale olive, with dark greenish gray stained root holes.
15/23/33		15	CL	Sandy clay, low to moderate plasticity, 25-40% sand, stiff, moist, olive and greenish gray, mottled, lensed with clayey sand.
10/17/24	▼	20	CH	Sandy clay, moderate to high plasticity, stiff, moist, olive.

## BORING LOG

Project No. KEI-P89-0703	Boring & Casing Diameter 9"                      2"	Logged By D.L.
Project Name Unocal, Oakland/MacArthur	Well Head Elevation N/A	Date Drilled 9/7/89
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Strati- graphy USCS	Description
37/50- 5-1/2"		25	GP- GC	Sandy clay, as above. Poorly graded gravel with clay and sand, very dense, wet, dark yellowish brown.
		30	GC	Clayey gravel, very dense, moist, yellowish brown.
		35		
		40		
				TOTAL DEPTH 29'



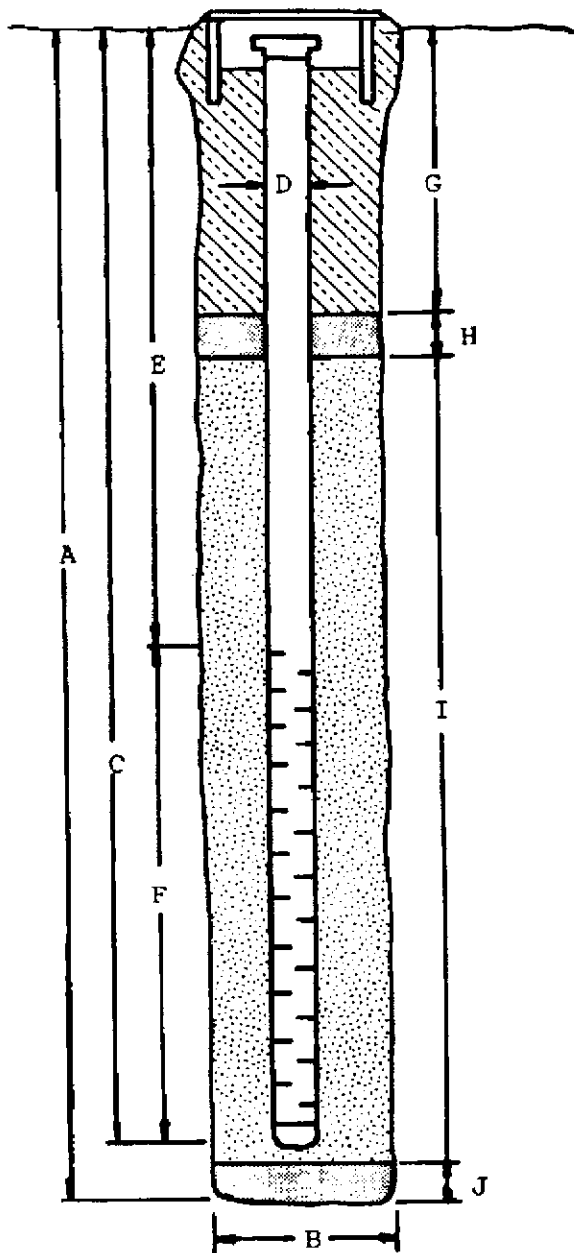
## W E L L   C O M P L E T I O N   D I A G R A M

PROJECT NAME: Unocal - Oakland, MacArthur BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.: \_\_\_\_\_

Flush-mounted Well Cover



A. Total Depth: 29'

B. Boring Diameter\*: 9"

Drilling Method: Hollow Stem  
Auger

C. Casing Length: 29'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"  
ID = 2.067"

E. Depth to Perforations: 5'

F. Perforated Length: 24'

Perforation Type: Machined  
Slot  
Perforation Size: 0.020"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 25'

Pack Material: RMC Lonestar  
Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

\*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

**B O R I N G   L O G**

<b>Project No.</b> KEI-P89-0703		<b>Boring &amp; Casing Diameter</b> 9"                      2"		<b>Logged By</b> D.L.
<b>Project Name</b> Unocal, Oakland/MacArthur		<b>Well Head Elevation</b> N/A		<b>Date Drilled</b> 9/6/89
<b>Boring No.</b> MW4		<b>Drilling Method</b>	<b>Hollow-stem Auger</b>	<b>Drilling Company</b> EGI
<b>Penetration blows/6"</b>	<b>G. W. level</b>	<b>Depth (ft) Samples</b>	<b>Stratigraphy USCS</b>	<b>Description</b>
		0		A.C. Pavement Sand and Gravel: Fill
12/16/25		5		Clay, high plasticity, very stiff, moist, very dark grayish brown, brown below 5'.
19/25/30		10	CH	Gravelly clay with sand, very stiff, moist, dark yellowish brown.
14/17/29		15		Clay, high plasticity, very stiff, slightly moist, light yellowish brown.
15/15/23	▽		SM	Silty clay, high plasticity, 10-15% fine sand, very stiff, moist, pale olive.
			SW	Silty sand, dense to very dense, very moist to wet, light yellowish brown.
		20		Well graded sand, trace to 10%

**B O R I N G   L O G**

<b>Project No.</b> KEI-P89-0703	<b>Boring &amp; Casing Diameter</b> 9"                      2"	<b>Logged By</b> D.L.
<b>Project Name</b> Unocal, Oakland/MacArthur	<b>Well Head Elevation</b> N/A	<b>Date Drilled</b> 9/6/89
<b>Boring No.</b> MW4	<b>Drilling Method</b> <b>Hollow-stem</b> <b>Auger</b>	<b>Drilling Company</b> EGI

<b>Penetra- tion blows/6"</b>	<b>G. W. level</b>	<b>Depth (ft) Samples</b>	<b>Strati- graphy USCS</b>	<b>Description</b>
			SW	finest, dense, wet, dark yellowish brown.
		25	GP- GC	Poorly graded gravel with clay and sand, dense, wet, dark yellowish brown, clay content, increasing with depth.
		30	CH	Gravelly clay, high plasticity, 5-10% sand, very stiff, moist, dark yellowish brown.
		35		
		40		
				<b>TOTAL DEPTH 29'</b>

## BORING LOG

Project No. KEI-P89-0703		Boring Diameter 9"		Logged By <i>JGG</i> W.W. <i>CEG 1633</i>
		Casing Diameter 2"		
Project Name Unocal S/S #3538 411 West MacArthur Blvd., Oakland		Well Cover Elevation		Date Drilled 11/18/92
Boring No. MW5		Drilling Method Hollow-stem Auger		Drilling Company Woodward Drilling Co.
Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		Six inches of concrete pavement over sand and gravel base.
				Silty clay, estimated at 35% silt, moist, black, strong brown staining in pores.
8/13/17		5	CL	Silty clay, estimated at 15% silt, 5% sand, and trace gravel to 3/8 inch in diameter, hard, moist, yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) mottled, trace pores.
				Silty clay, estimated at 35-40% silt, hard, moist, very pale brown (10YR 5/4) mottled.
8/11/16		10		Clayey silt, estimated at 15-20% clay and 5% fine-grained sand, very stiff, moist, pale yellow (2.5Y 7/3), trace pores.
			ML	Silt, estimated at 5-10% clay, very stiff, moist to very moist, pale yellow (2.5Y 7/3) with slight yellowish brown (10YR 5/6) mottling, trace sand and pores.
6/10/17		15		Silt, trace clay, hard, very moist, very pale brown (10YR 7/3) and strong brown (7.5YR 5/6) mottled, slightly micaceous.
10/20/24		20	CL	Silty clay, estimated at 35-40% silt, hard, moist, very pale brown (10YR 5/4) mottled.
8/13/25	▼		ML	Clayey silt, estimated at 15% clay and 5-10% sand, hard, very moist, pale yellow (2.5Y 7/3).

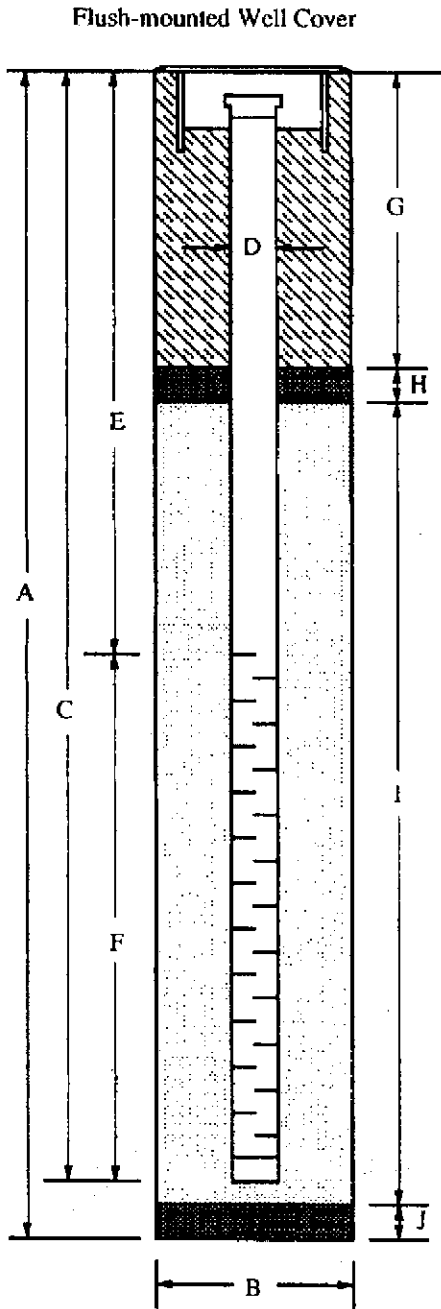
### BORING LOG

Project No. KEI-P89-0703	Boring Diameter	9"	Logged By W.W. <i>JGG</i> <i>CEG 1683</i>
	Casing Diameter	2"	
Project Name Unocal S/S #3538 411 West MacArthur Blvd., Oakland	Well Cover Elevation	Date Drilled 11/18/92	
Boring No. MW5	Drilling Method	Hollow-stem Auger	Drilling Company Woodward Drilling Co.

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
9/20/36		25	ML	Clayey silt, estimated at 15% clay and 5-10% sand, hard, very moist, pale yellow (2.5Y 7/3).
				Clayey silt, estimated at 20-25% clay and 5% sand, hard, moist, very pale brown (10YR 7/3).
13/19/28		30	CL	Silty clay, estimated at 15-20% fine-grained silt and 5% sand, hard, moist, very pale brown (10YR 7/3), trace organic matter.
				Silty clay, estimated at 15% silt, 5-10% sand, and trace gravel, hard, moist, very pale brown (10YR 7/3).
TOTAL DEPTH: 30'				
		35		
		40		

## WELL COMPLETION DIAGRAM


PROJECT NAME: Unocal S/S #3538, 411 West MacArthur Blvd., Oakland WELL NO. MW5  
 PROJECT NUMBER: KEI-P89-0703  
 WELL PERMIT NO.: 91185



- A. Total Depth : 30'
- B. Boring Diameter: 9"
- Drilling Method: Hollow Stem Auger
- C. Casing Length: 30'
- Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"  
ID = 2.067"
- E. Depth to Perforations: 13'
- F. Perforated Length: 17'
- Perforation Type: Machined Slot
- Perforation Size: 0.010"
- G. Surface Seal: 9'
- Seal Material: Neat Cement
- H. Seal: 2'
- Seal Material: Bentonite
- I. Filter Pack: 19'
- Pack Material: RMC Lonestar Sand
- Size: 2/12
- J. Bottom Seal: None
- Seal Material: N/A

## BORING LOG

<b>Project No.</b> KEI-P89-0703	<b>Boring Diameter</b> 9"	<b>Logged By</b> JGG W.W. CEG/633
	<b>Casing Diameter</b> 2"	
<b>Project Name</b> Unocal S/S #3538 411 West MacArthur Blvd., Oakland	<b>Well Cover Elevation</b>	<b>Date Drilled</b> 11/18/92
<b>Boring No.</b> MW6	<b>Drilling Method</b> Hollow-stem Auger	<b>Drilling Company</b> Woodward Drilling Co.

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		Fifteen inches of asphalt pavement.
18/30/34		5	CL	Silty clay, estimated at 20% silt and trace sand, moist, very dark gray.
				Silty clay, estimated at 20-25% silt and 5% sand, hard, moist, greenish gray (5GY 5/1).
				Silty clay with sand and gravel, estimated at 15-20% silt, 15% gravel to 2 inches in diameter, and 10-15% sand, hard, moist, greenish gray (5GY 5/1) with strong brown (7.5YR 4/6) staining.
19/23/35		10		Silty clay, estimated at 15% silt and trace sand, hard, moist, greenish gray (5GY 6/1) with slight light yellowish brown (10YR 6/4) mottling.
13/22/27		15		Silty clay, estimated at 20% silt, hard, moist, light yellowish brown (10YR 6/4) with slight light gray (5Y 7/1) staining in pores, trace organic matter.
12/18/20		20	ML	Clayey silt, estimated at 15% clay and 5-10% very fine-grained sand, hard, very moist, light yellowish brown (10YR 6/4).

### BORING LOG

<b>Project No.</b> KEI-P89-0703	<b>Boring Diameter</b> 9"	<b>Logged By</b> J66 <b>W.W.</b> CEG1633
	<b>Casing Diameter</b> 2"	
<b>Project Name</b> Unocal S/S #3538 411 West MacArthur Blvd., Oakland	<b>Well Cover Elevation</b>	<b>Date Drilled</b> 11/18/92
<b>Boring No.</b> MW6	<b>Drilling Method</b> Hollow-stem Auger	<b>Drilling Company</b> Woodward Drilling Co.

Penetration blows/6"	G. W. level	Depth (feet) Samples	Stratigraphy USCS	Description
7/10/13		25	ML	Clayey silt, estimated at 15% clay and trace sand, very stiff, very moist, light yellowish brown.
			CL	Silty clay, estimated at 20-30% slightly elastic silt, very stiff, moist, very pale brown.
8/15/21		30		Silty clay, estimated at 20-25% silt and trace gravel, hard, moist, light yellowish brown (10YR 6/4).
				TOTAL DEPTH: 30'
		35		
		40		

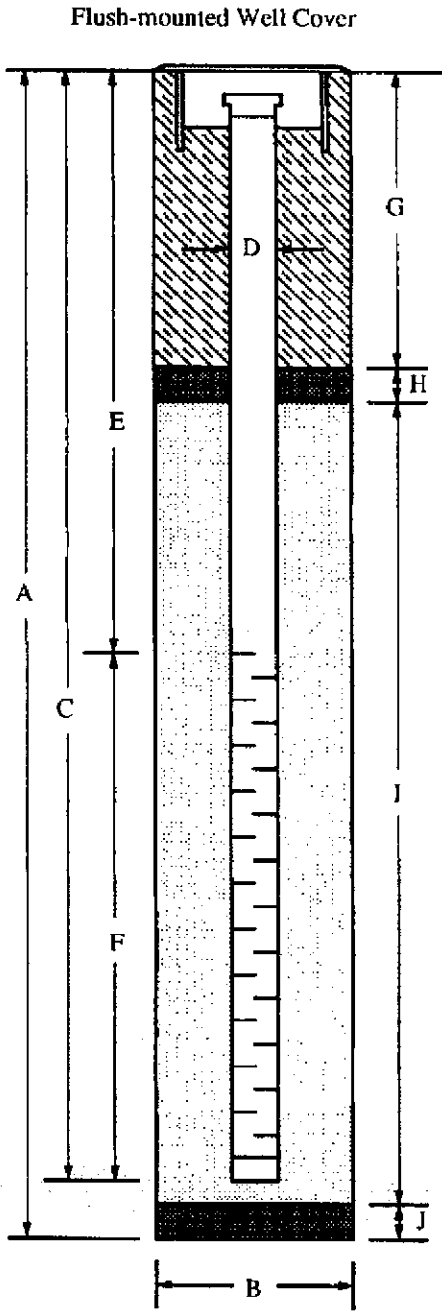


## WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3538, 411 West MacArthur Blvd., Oakland WELL NO. MW6

PROJECT NUMBER: KEI-P89-0703

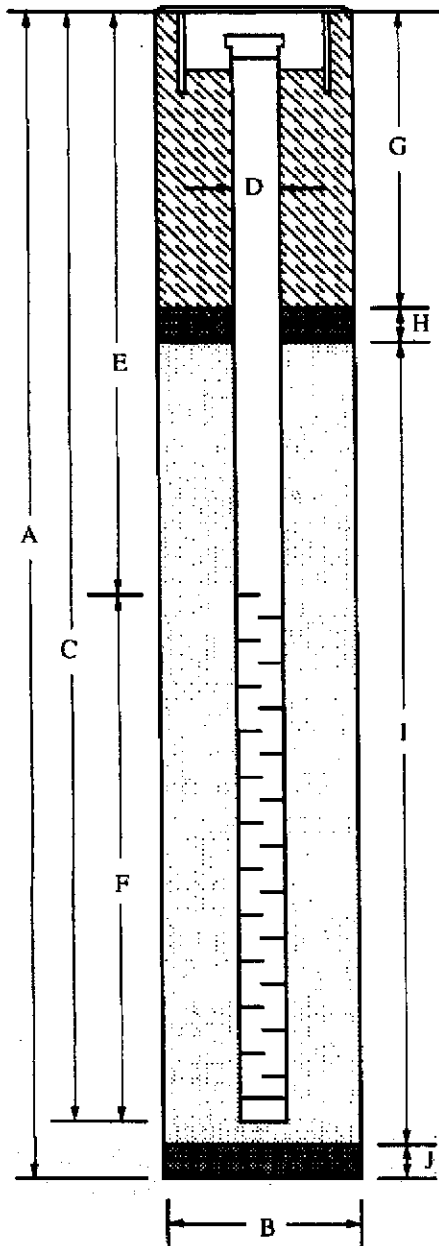
WELL PERMIT NO.: 91185



- A. Total Depth : 30'
- B. Boring Diameter: 9"
- Drilling Method: Hollow Stem Auger
- C. Casing Length: 30'
- Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"
- ID = 2.067"
- E. Depth to Perforations: 13'
- F. Perforated Length: 17'
- Perforation Type: Machined Slot
- Perforation Size: 0.010"
- G. Surface Seal: 9'
- Seal Material: Neat Cement
- H. Seal: 2'
- Seal Material: Bentonite
- I. Filter Pack: 19'
- Pack Material: RMC Lonestar Sand
- Size: 2/12
- J. Bottom Seal: None
- Seal Material: N/A

**WELL COMPLETION DIAGRAM  
(SCHEMATIC)**

Flush-mounted Well Cover



WELL DETAILS\*

1. Well will be terminated 10 to 15 feet into the first encountered ground water, unless an aquitard five feet or greater in thickness is encountered below the water table, in which case the bottom of the boring will be backfilled with bentonite pellets and the well terminated at the top of this aquitard [A].
2. Boring diameter [B] is 8 inches for 2 inch wells, 10 inches for 4 inch wells, and 12 inches for 6 inch wells.
3. Perforated interval [F] will extend from bottom of casing to five feet above the first encountered ground water table (unless water <5 feet deep).
4. Schedule 40 PVC casing, 2 inch in diameter [D], will be used. Screen is 0.020 or 0.010 inch factory machined slots, depending on filter pack grain size.
5. Filter pack will be placed from bottom of casing to two feet above perforated interval [I]. (Bottom seal [J] is not installed unless required.) One to two feet of bentonite [H] will be placed above the filter pack. Concrete grout [G] will be placed from top of bentonite seal to the surface (unless modified due to shallow water). Blank casing [E] will extend from the top of the perforated casing to the top of the hole.
6. The well will be installed with a waterproof cap, padlock and a flush-mounted well cover.

\* See text for additional information.