

# UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM CLOSED BERKELEY LANDFILL, BERKELEY, CALIFORNIA

CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
1947 CENTER STREET, 4TH FLOOR  
BERKELEY, CALIFORNIA 94704

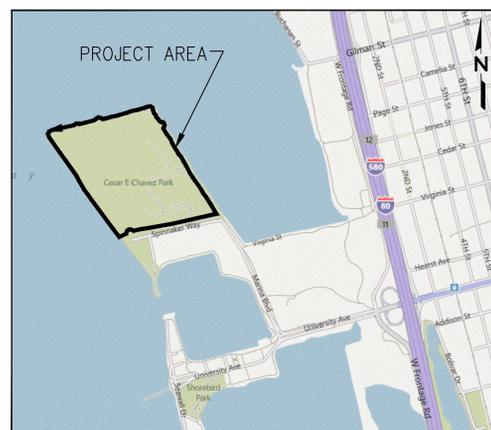


NO.	REVISION	DATE
1	ISSUED FOR CONSTRUCTION	5/26/15

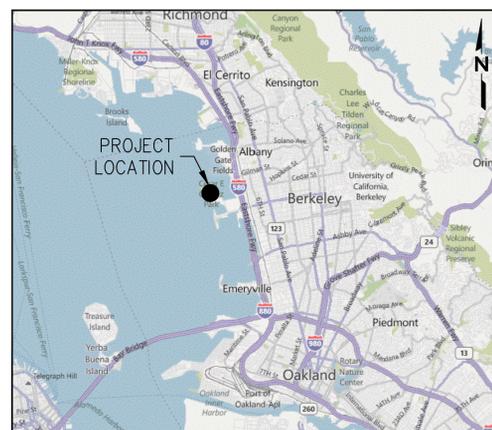
TITLE SHEET
PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY CALIFORNIA

CLIENT:  
CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
1947 CENTER ST., 4TH FLOOR  
BERKELEY, CALIFORNIA 94704

SCS ENGINEERS  
ENVIRONMENTAL CONSULTANTS  
6801 KOLL CENTER PARKWAY SUITE 140  
PLEASANTON, CA 94566  
PH: (925) 426-0080 FAX: (925) 426-0077  
PROJ. NO. 01210112.00  
APP. BY: R. RAMIREZ  
CHK. BY: S. KOTHARY  
ACAD FILE: 11/12/2011  
APP. BY: J. MILLER



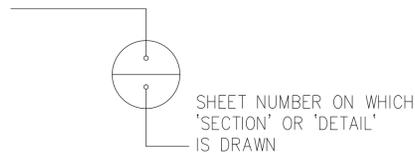
VICINITY MAP  
N.T.S.



LOCATION MAP  
N.T.S.

### SECTION AND DETAIL CROSS REFERENCING CONVENTION

1. EXPLANATION OF 'SECTION' OR 'DETAIL' SYMBOL.  
'SECTION' OR 'DETAIL' IDENTIFICATION NUMBER OR LETTER.

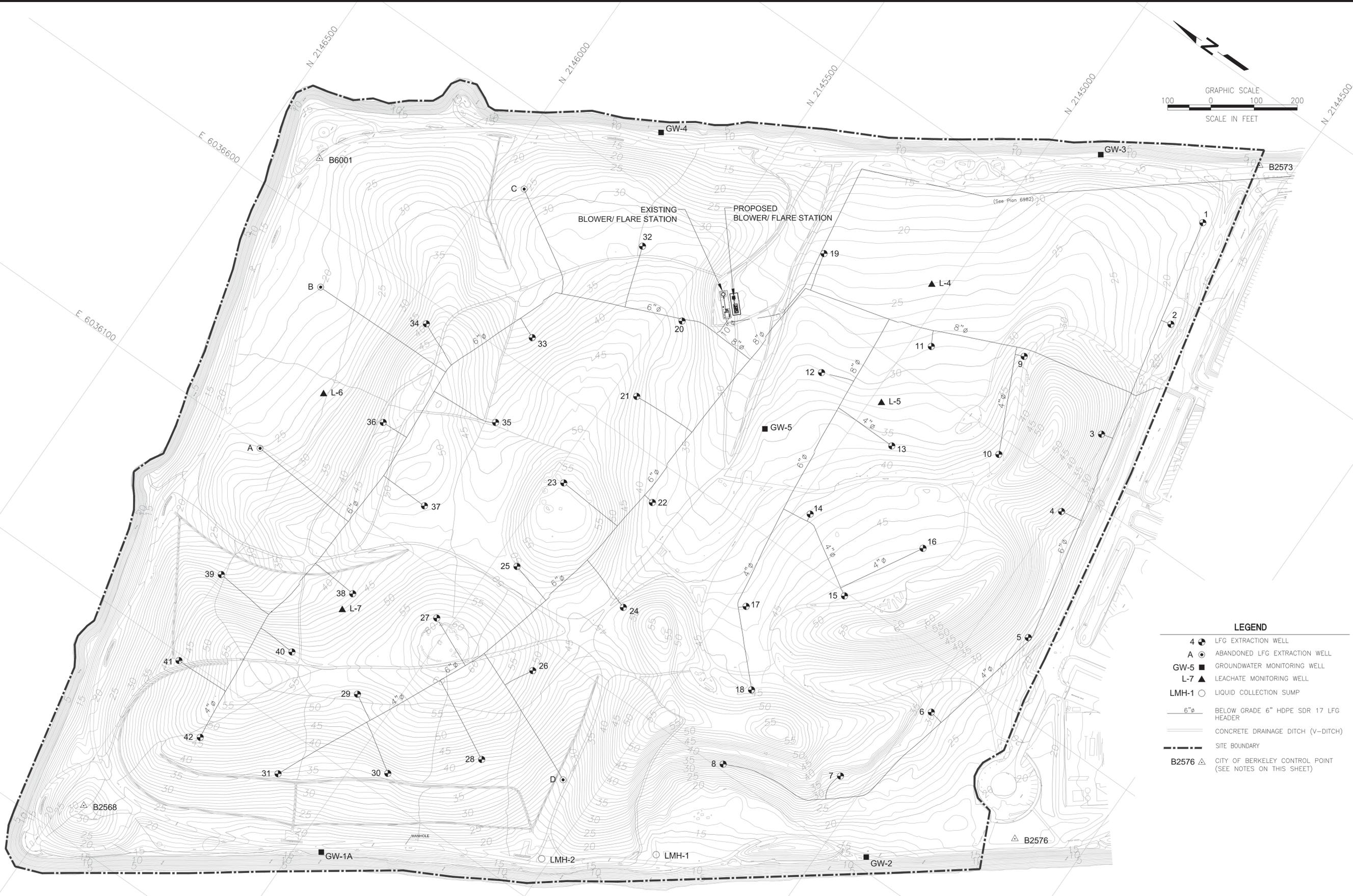
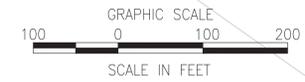


### INDEX OF SHEETS

DWG. No.	DESCRIPTION
1.	TITLE SHEET
2.	SITE PLAN - EXISTING LFG COLLECTION SYSTEM
3.	LFG EXTRACTION WELLS, SCHEDULE, AND MISCELLANEOUS DETAIL
4.	LFG FLARING SYSTEM - SCHEMATIC FLOW DIAGRAM
5.	LFG FLARING SYSTEM - PLAN
6.	LFG FLARING SYSTEM - SECTION
7.	LFG FLARING SYSTEM - STRUCTURAL NOTES
8.	LFG FLARING SYSTEM - STRUCTURAL DETAILS
9.	CHAIN LINK FENCE AND GATE DETAILS
10.	DEMOLITION PLAN - EXISTING LFG FLARING SYSTEM
11.	LFG FLARING SYSTEM - GRADING PLAN
12.	E-1 LFG FLARING SYSTEM - SINGLE LINE DIAGRAM AND LOAD SCHEDULES
13.	E-2 LFG FLARING SYSTEM - ELECTRICAL PLAN
14.	E-3 LFG FLARING SYSTEM - ELECTRICAL DETAILS
15.	E-4 LFG FLARING SYSTEM - ELECTRICAL DETAILS

DEPICTION OF MONUMENTS: _____	DATE _____	SUBMITTED: _____	DATE _____
SURVEY CHIEF OF PARTY _____		SUPERVISING CIVIL ENGINEER _____	R.C.E. _____
WATERSHED REVIEW: _____	DATE _____	APPROVED: _____	EXP. _____
ASSOCIATE CIVIL ENGINEER _____		MANAGER OF ENGINEERING _____	R.C.E. _____
			EXP. _____

DATE:	05-01-2012
SCALE:	AS SHOWN
DRAWING NO.:	1



**LEGEND**

- 4 LFG EXTRACTION WELL
- A ABANDONED LFG EXTRACTION WELL
- GW-5 GROUNDWATER MONITORING WELL
- L-7 LEACHATE MONITORING WELL
- LMH-1 LIQUID COLLECTION SUMP
- 6" BELOW GRADE 6" HDPE SDR 17 LFG HEADER
- CONCRETE DRAINAGE DITCH (V-DITCH)
- SITE BOUNDARY
- B2576 CITY OF BERKELEY CONTROL POINT (SEE NOTES ON THIS SHEET)

**NOTES:**  
 GROUND SURVEY PERFORMED BY TRUE NORTH SURVEYING, INC. THE HORIZONTAL COORDINATES AND VERTICAL DATUM IS BASED ON THE CITY OF BERKELEY SURVEY CONTROL POINTS LISTED BELOW WHICH ARE IN GROUND VALUES USING AN ASSUMED ORIGIN FOR THE HORIZONTAL AND MLLW DATUM FOR THE VERTICAL. THE FOUR (4) CITY OF BERKELEY CONTROL POINTS TIED IN ON THIS SURVEY ARE:

POINT	NORTHING	EASTING	EL.	DESCRIPTION
B6001	2146363.6601	6036720.7144	18.67	MAG NAIL SET IN ASPHALT PATH
B2568	2145955.6565	6035186.2956	31.00	CITY BRASS DISK MONUMENT IN CONCRETE PILLAR AT GRADE
B2573	2144572.0443	6037955.5481	10.56	CITY BRASS DISK MONUMENT IN STANDARD MONUMENT WELL
B2576	2144146.3552	6036359.7223	19.58	BRASS PIN CITY MONUMENT IN STANDARD MONUMENT WELL

EXISTING TOPOGRAPHIC PLAN IS FURNISHED BY H/W GEOSPATIAL, INC. THE TOPOGRAPHY DATA IS BASED ON NOVEMBER 4, 2010 AERIAL PHOTOGRAPHY.

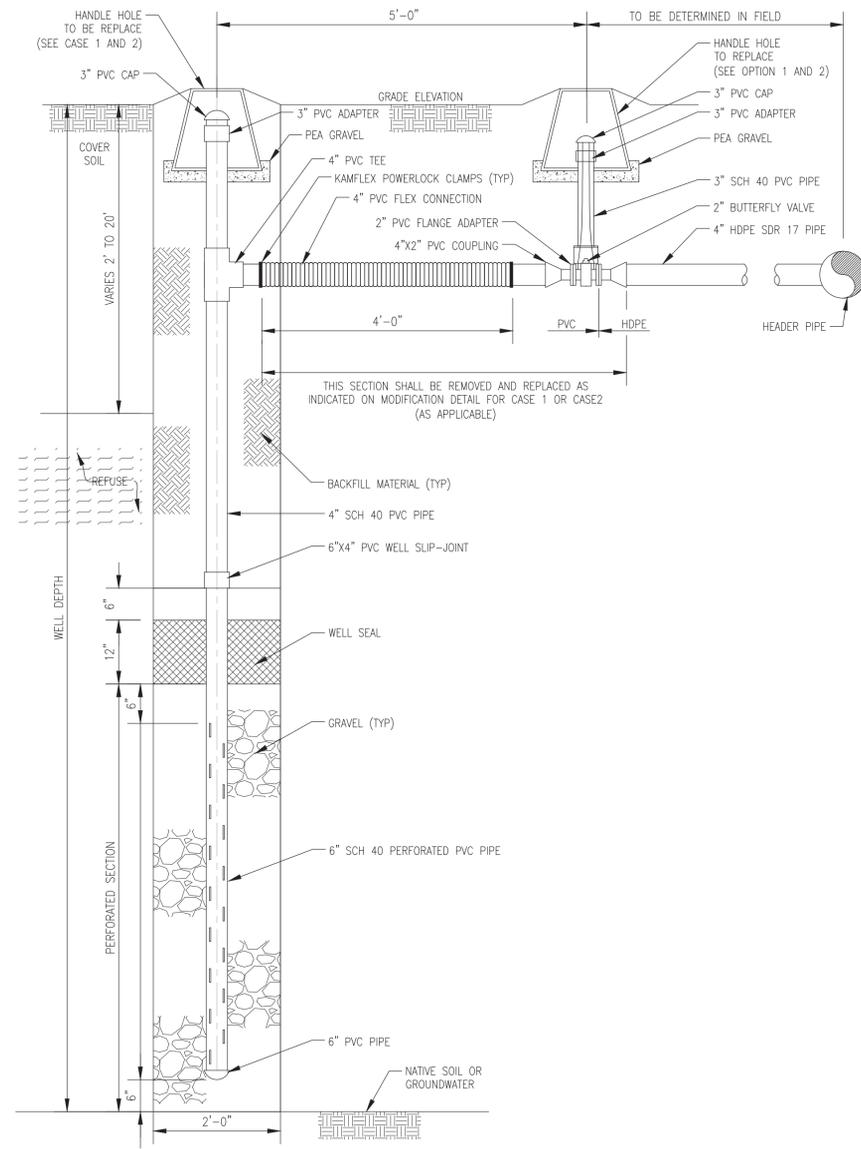
DATE		REVISION		NO.	
<p><b>SHEET TITLE:</b> SITE PLAN - EXISTING LFG COLLECTION SYSTEM</p> <p><b>PROJECT TITLE:</b> UPGRADE OF EXISTING LFG COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY, CALIFORNIA</p>					
<p><b>CITY OF BERKELEY</b>          DEPARTMENT OF PUBLIC WORKS          ENGINEERING DIVISION          1947 CENTER ST., 4TH FLOOR          BERKELEY, CALIFORNIA 94704</p>					
<p><b>SCS ENGINEERS</b>          ENVIRONMENTAL CONSULTANTS</p> <p>5601 KOLL CENTER PARKWAY SUITE 140          PLEASANTON, CA 94566          PH. (925) 426-0080 FAX. (925) 426-0707</p>		<p><b>CLIENT:</b> CITY OF BERKELEY</p>			
<p>PROJ. NO. 0121012.00</p>	<p>DATE: 05-01-2012</p>	<p>SCALE: AS SHOWN</p>	<p>APP. BY: J. MILLER</p>	<p>CHK. BY: S. KOTHARY</p>	<p>DRAWN BY: R. RAMIREZ</p>
<p>DRAWING NO.: 2</p>					

N:\CAD\2011\0121012.00 - Berkeley LF Design\Design 3 (FINAL with SEAL\_5-9-12)\Sheet 2 (Existing LFG Collection System).dwg May 30, 2012 - 1:5pm By: 2747\_r



**WELL LOCATION SCHEDULE**

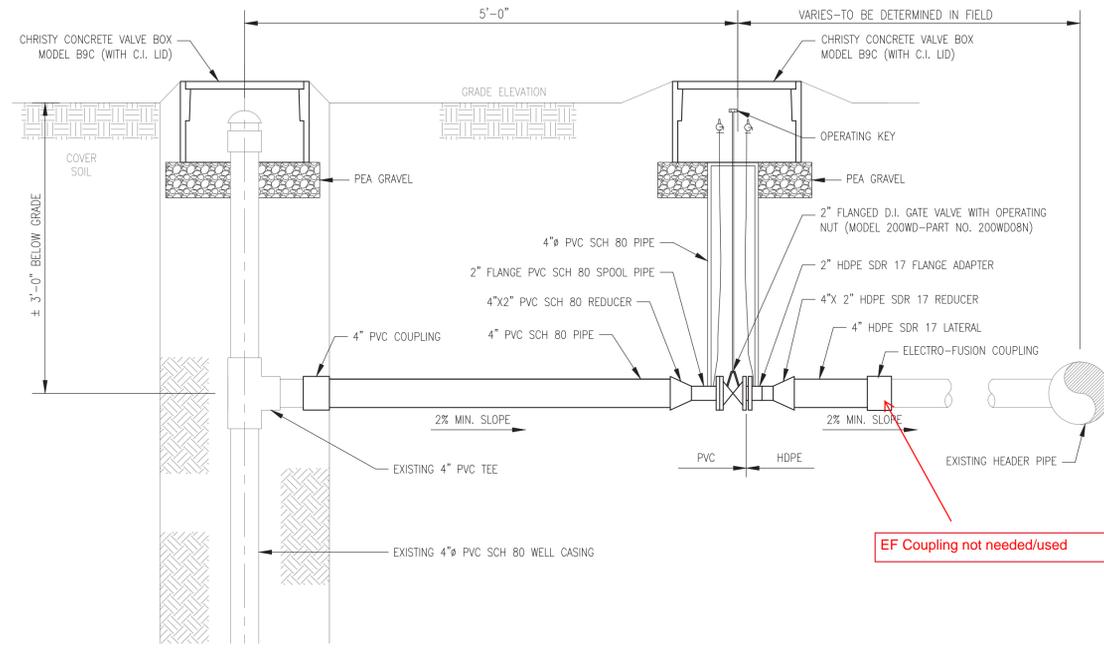
WELL No.	LOCATION COORDINATES	
	NORTH	EAST
1	2,144,604	6,037,772
2	2,144,530	6,037,538
3	2,144,517	6,037,238
4	2,144,490	6,037,039
5	2,144,387	6,036,757
6	2,144,472	6,036,488
7	2,144,559	6,036,246
8	2,144,798	6,036,113
9	2,144,766	6,037,282
10	2,144,684	6,037,064
11	2,144,955	6,037,178
12	2,145,128	6,036,983
13	2,144,898	6,036,937
14	2,144,963	6,036,700
15	2,144,790	6,036,592
16	2,144,704	6,036,786
17	2,144,962	6,036,441
18	2,144,842	6,036,291
19	2,145,281	6,037,210
20	2,145,461	6,036,895
21	2,145,447	6,036,692
22	2,145,278	6,036,513
23	2,145,471	6,036,432
24	2,145,194	6,036,276
25	2,145,450	6,036,212
26	2,145,282	6,036,037
27	2,145,534	6,036,009
28	2,145,262	6,035,801
29	2,145,583	6,035,760
30	2,145,421	6,035,651
31	2,145,629	6,035,504
32	2,145,635	6,036,983
33	2,145,723	6,036,664
34	2,145,942	6,036,550
35	2,145,680	6,036,456
36	2,145,894	6,036,307
37	2,145,705	6,036,204
38	2,145,725	6,035,943
39	2,146,000	6,035,805
40	2,145,763	6,035,752
41	2,145,966	6,035,586
42	2,145,824	6,035,469



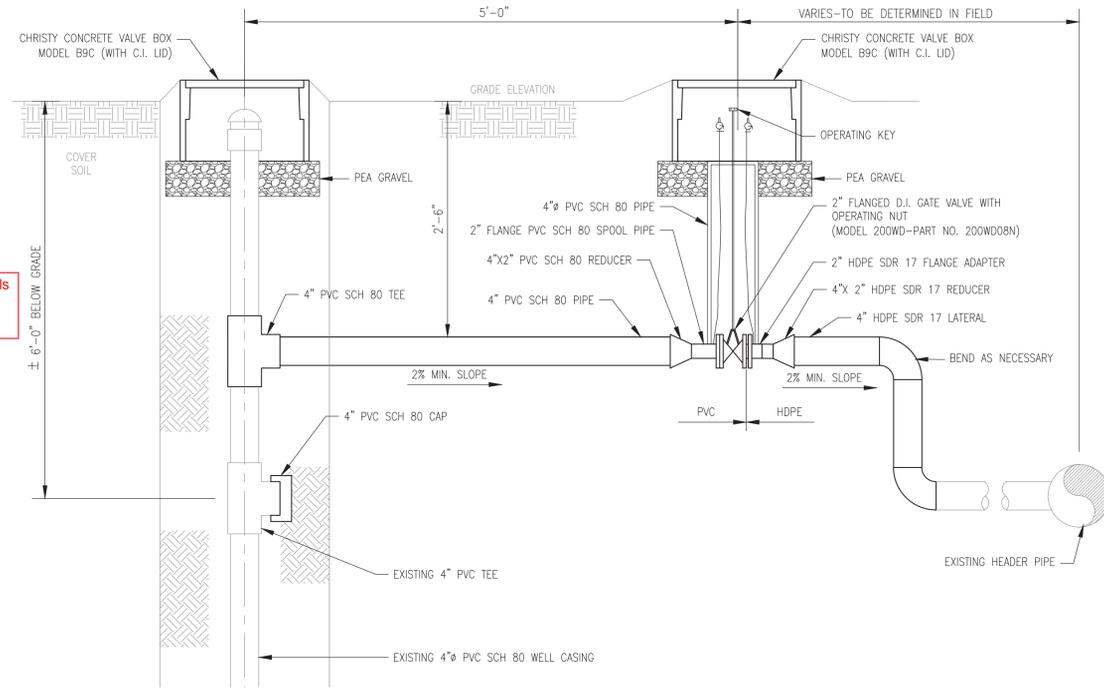
**EXISTING LFG EXTRACTION WELL AND LATERAL ( TYP )**

**NOTES:**

1. THE EXISTING WELL DETAILS DEPICTED ON THIS DRAWING HAVE BEEN REPRODUCED FROM THE "AS-BUILT" DRAWINGS FURNISHED BY THE CITY.
2. WELL LOCATIONS COORDINATES ARE COMPUTED FROM THE "AS-BUILTS" DRAWINGS.



**CASE 1 - MODIFICATION FOR SHALLOW LATERAL CONNECTION**



**CASE 2 - MODIFICATION FOR DEEP LATERAL CONNECTION**

DATE	
REVISION	
NO.	

SHEET TITLE: LFG EXTRACTION WELLS, SCHEDULE, AND MISCELLANEOUS DETAIL  
 PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
 BERKELEY LANDFILL  
 BERKELEY CALIFORNIA

CLIENT: CITY OF BERKELEY  
 DEPARTMENT OF PUBLIC WORKS  
 1847 CENTER ST., 4TH FLOOR  
 BERKELEY, CALIFORNIA 94704

**SCS ENGINEERS**  
 ENVIRONMENTAL CONSULTANTS  
 6601 KOLL CENTER PARKWAY SUITE 140  
 PLEASANTON, CA 94566  
 PH. (925) 426-0080 FAX. (925) 426-0707  
 PROJ. NO. 0121012.00  
 DSN. BY: S. KOTHARY  
 ACAD. FILE: N/2011  
 R. RAMIREZ  
 CHK. BY: S. KOTHARY  
 APP. BY: J. MILLER

DATE: 05-01-2012

SCALE: AS SHOWN

DRAWING NO.:

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NO.	REVISION	DATE

SHEET TITLE: LFG FLARING SYSTEM - SCHEMATIC FLOW DIAGRAM  
 PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM, BERKELEY LANDFILL, BERKELEY CALIFORNIA

CITY OF BERKELEY  
 DEPARTMENT OF PUBLIC WORKS  
 1847 CENTER ST., 4TH FLOOR  
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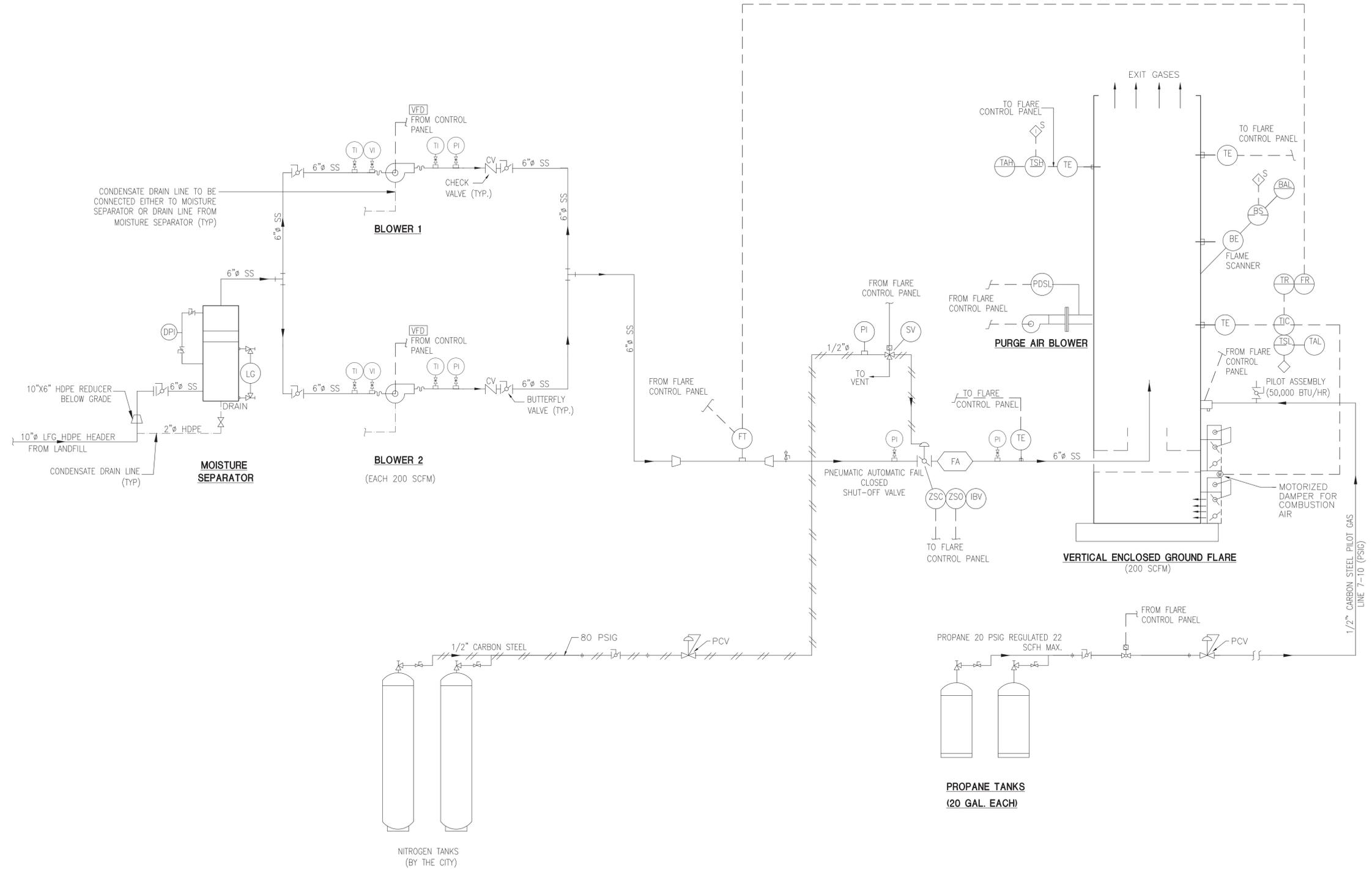
CLIENT: CITY OF BERKELEY  
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 6601 KOLL CENTER PARKWAY SUITE 140  
 PLEASANTON, CA 94566  
 PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 01210112.00  
 DSN. BY: S. KOTHARY  
 DRAW. BY: R. RAMIREZ  
 CHECK. BY: S. KOTHARY  
 ACAD. FILE: N/2011  
 APP. BY: J. MILLER

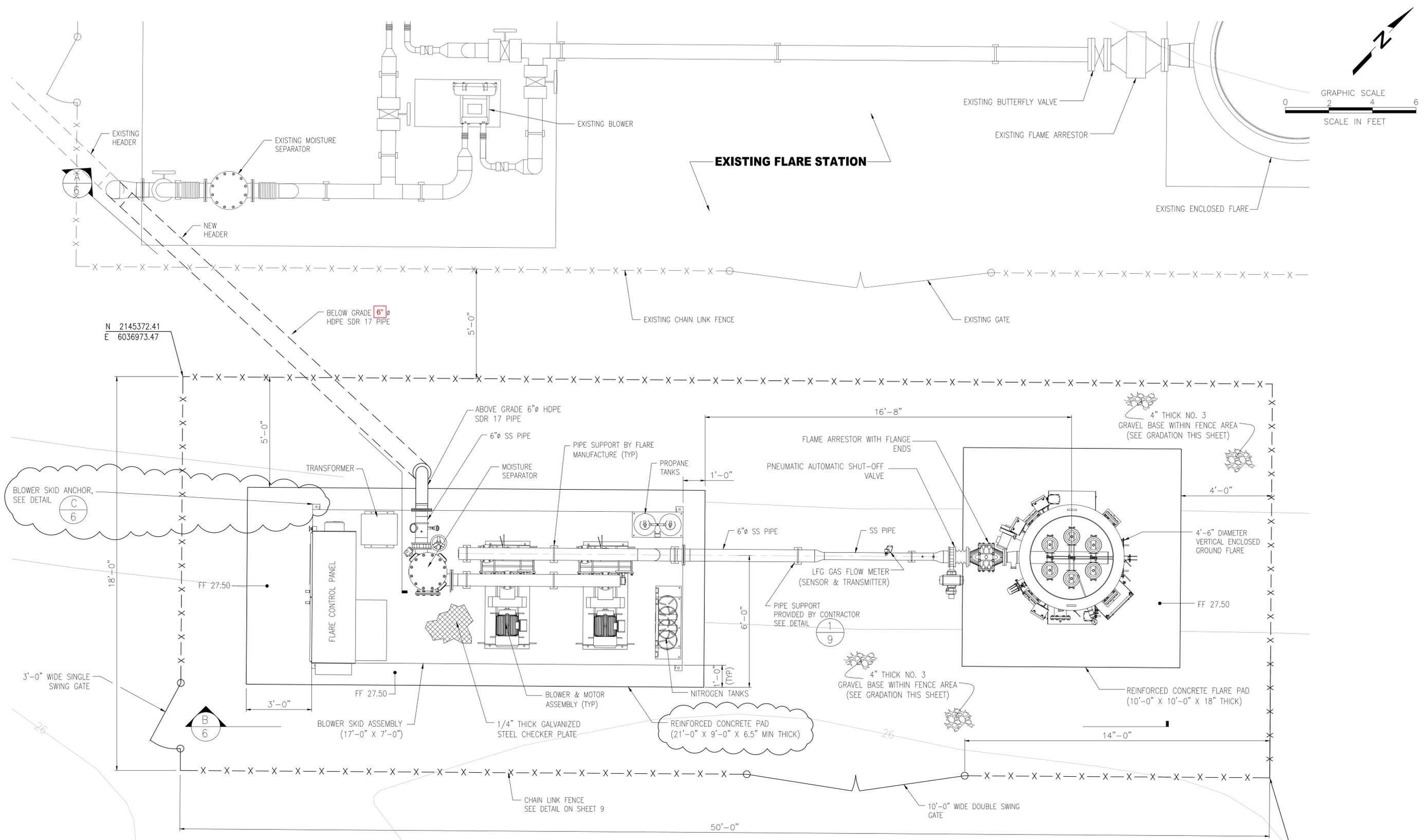
DATE: 05-01-2012  
 SCALE: AS SHOWN  
 DRAWING NO.: 4

LEGEND:		
GENERAL INSTRUMENT SYMBOL BALLOONS		
LOCALLY MOUNTED	MOUNTED ON FLARE CONTROL PANEL	MOUNTED BEHIND FLARE CONTROL PANEL
ABBREVIATIONS		
BAL	BURNER ALARM	
BE	BURNER ELEMENT	
BS	BURNER SWITCH	
CV	CHECK VALVE	
DPI	DIFFERENTIAL PRESSURE INDICATOR	
FR	FLOW RECORDER	
FT	FLOW TRANSMITTER	
FCV	FLOW CONTROL VALVE	
LAH	LEVEL ALARM HIGH	
LG	LEVEL GAUGE	
PCV	PRESSURE CONTROL VALVE	
PI	PRESSURE INDICATOR	
PDSL	PRESSURE DIFFERENTIAL SWITCH LOW	
TAH	TEMPERATURE ALARM HIGH	
TAL	TEMPERATURE ALARM LOW	
TE	TEMPERATURE ELEMENT	
TIC	TEMPERATURE INDICATING CONTROLLER	
TR	TEMPERATURE RECORDER	
TSH	TEMPERATURE SWITCH HIGH	
TSL	TEMPERATURE SWITCH LOW	
ZSO	LIMIT SWITCH TO PROVE VALVE IN OPEN POSITION	
ZSC	LIMIT SWITCH TO PROVE VALVE IN CLOSED POSITION	
IBV	INLET BLOCK VALVE	
VI	VACUUM INDICATOR	
SV	SOLENOID VALVE	
ABBREVIATIONS (OTHER THAN INSTRUMENTS)		
FA	FLAME ARRESTOR	
LFG	LANDFILL GAS	
SS	STAINLESS STEEL	
HDPE	HIGH DENSITY POLYETHYLENE	
PVC	POLYVINYL CHLORIDE	
DI	DUCTILE IRON	
SYMBOLS		
	TRANSMISSION LINE (PNEUMATIC)	
	ELECTRICAL SIGNAL	
	FLOW LINE	
	LOCAL INTERLOCK	



LANDFILL GAS FLARING SYSTEM - SCHEMATIC FLOW DIAGRAM  
 N.T.S.

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**NOTES:**

- PIPE SUPPORTS SHOWN ON THE DRAWINGS ARE INTENDED TO BE DEPICTIVE AND MAY NOT REPRESENT THE EXACT NUMBER REQUIRED TO SUPPORT THE PIPING AND APPURTENANCES IN A FIRM SUBSTANTIAL MANNER FROM THE SLAB/FINISH GRADE AT THE REQUIRED ELEVATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SUFFICIENT NUMBER OF PIPE SUPPORTS WHERE REQUIRED OR AS RECOMMENDED BY THE PIPE MANUFACTURER.
- IN LIEU OF STAINLESS STEEL PIPING (AS INDICATED), THE CONTRACTOR CAN FURNISH ALUMINUM PIPING.
- ALL VALVES WITHIN THE FLARE STATION SHALL BE METAL VALVES.
- A CONTINUOUS 1/4" THICK GALVANIZED STEEL CHECKER PLATE SHALL BE PLACED OVER ENTIRE BLOWER SKID.
- ALL ABOVE GRADE COMPRESSED NITROGEN AND PROPANE LINES SHALL BE SUPPORTED USING PIPE SUPPORTS.
- GRADING WORK WILL BE DONE FOR THE NEW FLARE STATION FENCED AREA AS INDICATED ON SHEET 11 GRADING PLAN. THE FINAL GRADING WORK WILL COMMENCE AFTER DEMOLITION OF THE EXISTING FLARE STATION IS COMPLETED.

**PLAN - LFG FLARING SYSTEM**  
SCALE: 1/2"=1'-0"

**GRAIN SIZE FOR GRAVEL**

SIEVE SIZE	PERCENTAGE PASSING SIEVE
2" (50 mm)	-
1-1/2" (37.5 mm)	100
1" (25.0 mm)	90-100
3/4" (19.0mm)	55-85
3/8" (9.5mm)	8-20
No. 4 (4.75mm)	0-5
No. 8 (2.36mm)	0-5
No. 200 (75µm)	0-2
ASTM C 131 TEST GRADING	B

EXISTING TOPOGRAPHIC PLAN IS FURNISHED BY HJW GEOSPATIAL, INC. THE TOPOGRAPHY DATA IS BASED ON NOVEMBER 4, 2010 AERIAL PHOTOGRAPHY.

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SHEET TITLE: LFG FLARING SYSTEM - PLAN  
PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY CALIFORNIA

CLIENT: CITY OF BERKELEY  
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BERKELEY, CALIFORNIA 94704

SCS ENGINEERS ENVIRONMENTAL CONSULTANTS  
6601 KOLL CENTER PARKWAY SUITE 140  
PESQUERA, CA 94956  
TEL (925) 426-0080 FAX (925) 426-0707  
DWN. BY: R. RAMIREZ  
APP. BY: J. MILLER  
CHK. BY: S. KOTHARY  
ACAD FILE: N/2011

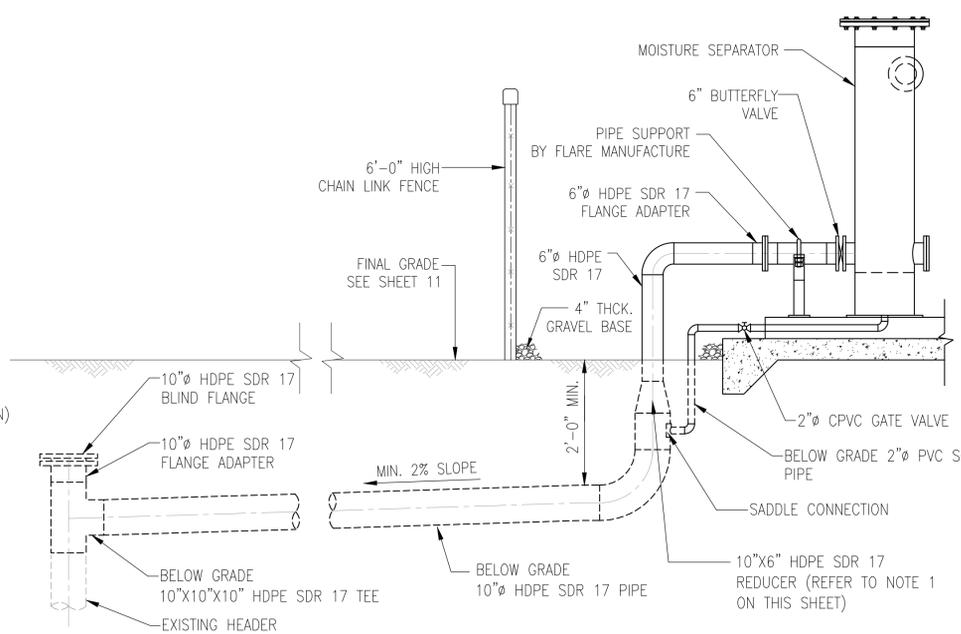
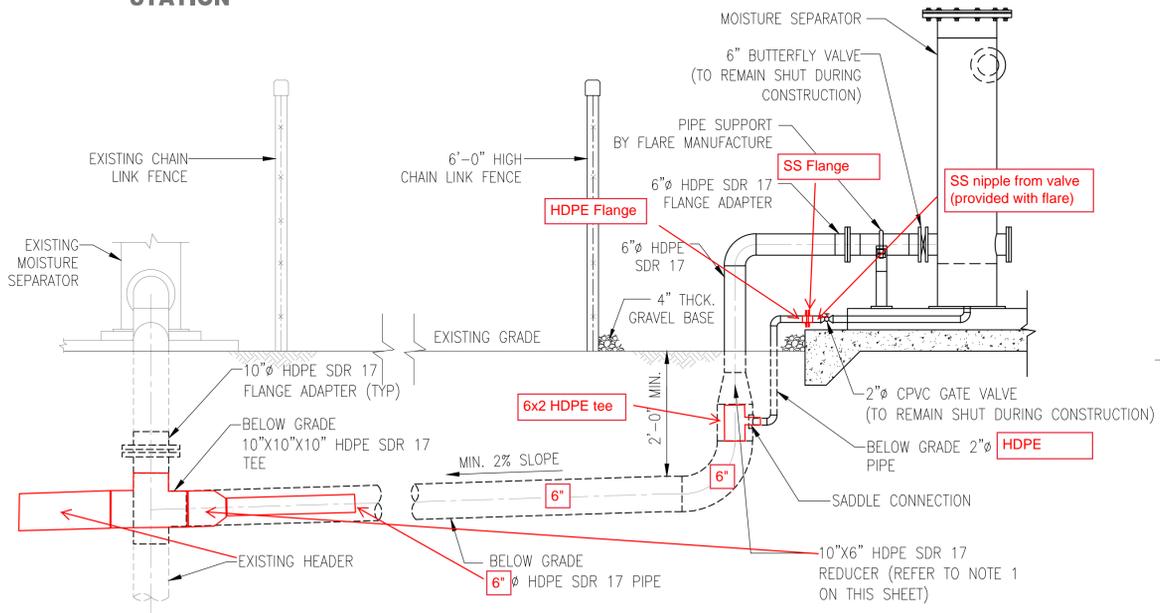
DATE: 05-02-2012  
SCALE: AS SHOWN  
DRAWING NO.: 5



**EXISTING FLARE STATION**

**NEW FLARE STATION**

**NEW FLARE STATION**



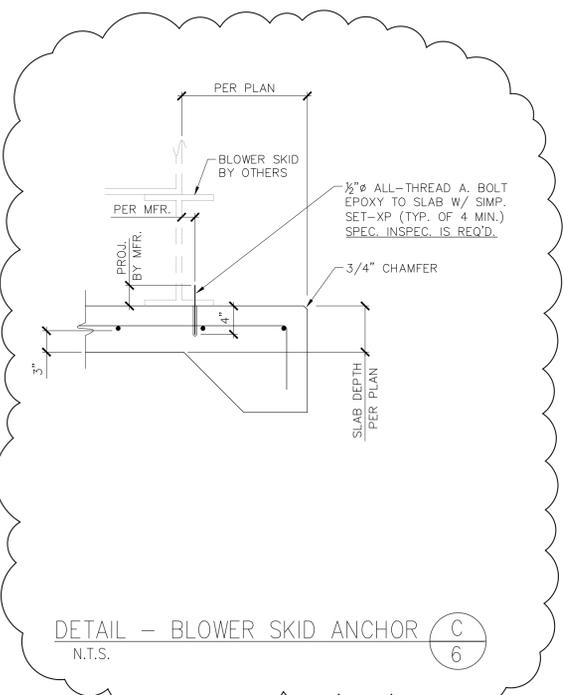
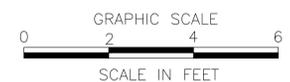
NOTES:

1. TIME REQUIRED FOR CONNECTING NEW HEADER (TO NEW FLARE STATION) TO THE EXISTING HEADER AND FOR SWITCHING OPERATION FROM EXISTING TO NEW FLARING SYSTEM, SHALL BE ACHIEVED IN SHORTEST TIME POSSIBLE AND WITHIN THE PARAMETERS SET BY BAAQMD PERMIT TO OPERATE.
2. UPON SUCCESSFULLY COMPLETION OF DEMONSTRATION TESTS OF THE NEW BLOWER/FLARE STATION, THE EXISTING BLOWER/FLARE STATION SHALL BE PUT OUT OF COMMISSION BY BLOCKING THE LFG SUPPLY LINE TO EXISTING FLARE STATION WITH A BLIND FLANGE AS SHOWN IN DETAIL A/6-CASE 2

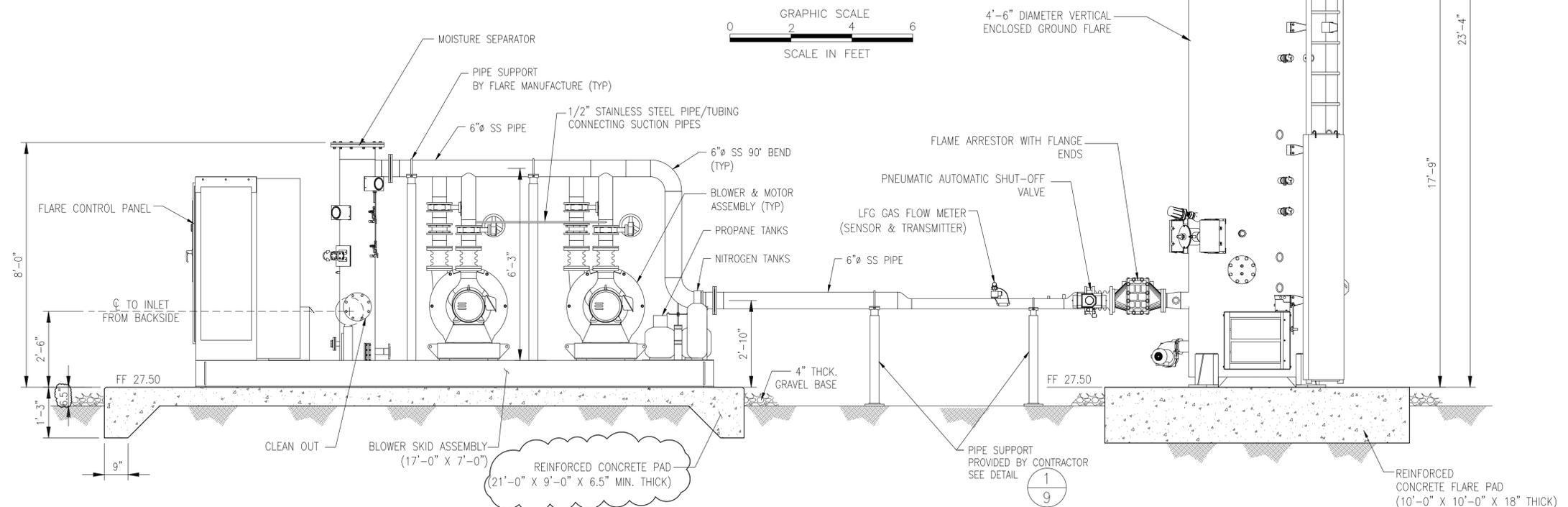
CASE 1 – DURING INSTALLATION OF NEW BLOWER/FLARE STATION  
N.T.S.

CASE 2 – DURING DEMOLITION OF EXISTING BLOWER/FLARE STATION  
N.T.S.

SECTION A  
N.T.S.



DETAIL – BLOWER SKID ANCHOR  
N.T.S.



SECTION B  
SCALE: 1/2" = 1'-0"

DATE	5/26/15
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SHEET TITLE: LFG FLARING SYSTEM – SECTION  
PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
BERKELEY LANDFILL  
BERKELEY CALIFORNIA

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SCS ENGINEERS ENVIRONMENTAL CONSULTANTS  
6601 KOLL CENTER PARKWAY SUITE 400  
PLEASANTON, CA 94566  
TEL: (925) 426-0080 FAX: (925) 426-0707  
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## CONCRETE NOTES

1. PROPERTIES OF CONCRETE SHALL BE AS FOLLOWS:

USE	MAXIMUM AGGREGATE SIZE	MINIMUM 28 DAY COMP. STRENGTH (PSI)	MAXIMUM WATER/CEMENT RATIO	MINIMUM CEMENT SACK PER CY	MAX. SLUMP
FOUNDATIONS	1"	3,000	0.55	5.5	4"

2. CONCRETE SPECIFIED IN THESE DRAWINGS SHALL BE CONSIDERED AS STRUCTURAL CONCRETE.

3. THE DIMENSIONS SHOWN FOR LOCATION OF REINFORCING STEEL ARE TO FACE OF BAR AND DENOTE CLEAR COVERAGE. UNLESS SPECIFICALLY NOTED, CONCRETE COVERAGE SHALL BE AS FOLLOWS:

LOCATION	COVERAGE
CONCRETE DEPOSITED DIRECTLY AGAINST THE GROUND (EXCEPT SLABS)	3"
CONCRETE EXPOSED TO THE GROUND BUT PLACED IN FORMS	2"
SLABS ON GRADE (CLEARANCE TO TOP SURFACE)	SEE PLANS & DETAILS

4. REINFORCEMENT SHALL CONFORM TO ASTM A615 GRADE 60.

5. CONTINUOUS REINFORCEMENT SHALL BE SPLICED BY LAPPING THE REINFORCEMENT WITH THE MINIMUM LENGTH SHOWN IN BELOW.

6. ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A36, UNLESS NOTED OTHERWISE.

7. REFER TO BOTH CIVIL AND MECHANICAL DRAWINGS FOR LOCATION AND SPACING OF ALL PLUMBING FIXTURES.

8. ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS AND OTHER INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO POURING CONCRETE.

9. ANCHOR BOLTS OR SILL BOLTS SHALL BE HEX HEAD BOLTS UNLESS OTHERWISE NOTED. DO NOT USE UPSET (ROLLED) THREADS.

10. ALL WELDING OF REINFORCEMENT SHALL BE LOW HYDROGEN ELECTRODES UNLESS OTHERWISE NOTED. WELDING OF REINFORCING SHALL BE ALLOWED ONLY WHERE DETAILED ON DRAWINGS. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY SPECIFICATIONS AWS D1.4. WELDING SHALL NOT BE DONE WITHIN TWO BAR DIAMETERS OF ANY BENT PORTION OF A BAR THAT HAS BEEN BENT COLD. WELDING OF CROSSING BARS SHALL NOT BE PERMITTED FOR ASSEMBLY OF REINFORCEMENT UNLESS AUTHORIZED BY THE STRUCTURAL ENGINEER OF RECORD. ASTM A706 REINFORCING SHALL BE USED FOR ALL REINFORCING THAT IS BEING WELDED.

11. PIPES LARGER THAN 1-1/2" DIAMETER SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE EXCEPT WHERE SPECIFICALLY APPROVED BY STRUCTURAL ENGINEER. PIPES SHALL NOT DISPLACE OR INTERRUPT REINFORCING BARS.

## FOUNDATION NOTES

1. ALL FOOTINGS SHALL EXTEND TO FIRM BEARING IN UNDISTURBED SOIL OR ENGINEERED FILL.

2. ALL REINFORCING STEEL, ANCHOR BOLTS, AND OTHER EMBEDDED ITEMS SHALL BE SECURELY POSITIONED IN THE FORMS PRIOR TO POURING OF CONCRETE.

3. SEE CONCRETE NOTES FOR LAP REQUIREMENTS.

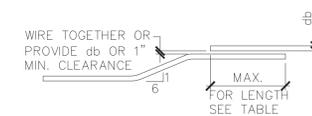
4. EXCAVATION: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION PROCEDURES AND FOR PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES.

5. BACKFILL: DO NOT BACKFILL UNTILL 7 DAYS MINIMUM AFTER COMPLETION OF THE SLABS.

6. FOUNDATION DESIGNS ARE BASED UPON THE SOILS REPORT PARAMETERS ARE AS FOLLOWS:

- A. SOIL CLASSIFICATION: WELL GRADED FINE SAND (SW)  
 B. MAXIMUM ALLOWABLE SOIL BEARING PRESSURE:  
 DEAD LOAD PLUS LIVE LOAD = 2.0 KSF  
 DEAD LOAD PLUS LIVE LOAD PLUS WIND OR (SEISMIC) = 2.33 KSF  
 C. PASSIVE RESISTANCE = 350 PCF  
 D. MODULUS OF SUBGRADE REACTION = 35 PCI  
 E. COEFFICIENT OF FRICTION = 0.35 (ULTIMATE)

BAR SIZE	LAP LENGTH										
	#3	#4	#5	#6	#7	#8	#9	#10	#11		
BOTTOM BAR	20"	26"	33"	39"	46"	55"	70"	89"	109"		
TOP BAR	26"	34"	43"	51"	60"	72"	91"	115"	141"		



### NOTES:

- SPLICES ARE SHOWN IN INCHES AND SHALL CONFORM TO CLASS "B" SPLICES AS PER ACI 318 (LATEST EDITION).
- SPLICE LENGTHS ASSUME THE MODIFICATION FACTORS OF ACI 318 SECTIONS 12.2 ARE 1.0. FOR OTHER CONDITIONS PROVIDE SPLICE LENGTHS IN ACCORDANCE WITH ACI 318.
- USE THE SPLICE LENGTH GIVEN FOR TOP BARS WHEN MORE THAN 12" OF CONC. IS CAST BELOW HORIZONTAL BARS IN THE MEMBER. USE THE SPLICE LENGTH GIVEN FOR BOTTOM BARS FOR ALL OTHER CONDITIONS.

## GENERAL STRUCTURAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH 2010 CALIFORNIA BUILDING CODE (C.B.C.).

2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES.

3. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS OR SPECIFICATIONS.

4. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDUM.

5. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING AND SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT.

6. TEMPORARY BRACING OR SHORING SHALL NOT BE REMOVED UNTIL MATERIALS REACH THEIR DESIGN STRENGTH.

7. OPENINGS, POCKETS, ETC. SHALL NOT BE PLACED IN SLABS UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS. NOTIFY THE ENGINEER WHEN DRAWINGS BY OTHERS SHOW OPENINGS POCKETS ETC., NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT WHICH ARE LOCATED IN STRUCTURAL MEMBERS.

8. CONTRACTOR SHALL READ AND FOLLOW ALL REFERENCED ICC REPORTS FOR INSTALLATION OF ITEMS SHOWN. ALTERNATIVE METHODS OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL TO THE ENGINEER WITH APPLICABLE ICC REPORTS.

9. IT IS THE INTENT OF THESE PLANS TO PROVIDE DETAILS OF CONSTRUCTION NECESSARY TO GUIDE THE GENERAL CONTRACTOR WITH STRUCTURAL ASPECTS OF THE PROJECT ONLY.

10. DO NOT SCALE STRUCTURAL DRAWINGS. IF DIMENSIONS OR DETAILS ARE NOT CLEAR, OR IF DISCREPANCIES EXIST ON THE DRAWINGS CONTACT THE ENGINEER.

11. SEE MECHANICAL, ELECTRICAL AND/OR ARCHITECTURAL DRAWINGS FOR LOCATION AND SIZES OF PIPES, CONDUITS, FLOOR DRAINS, VENTS, DUCTS, DRAIN LEADERS AND OTHER SIMILAR OPENINGS NOT INDICATED ON THESE STRUCTURAL DRAWINGS.

12. SEE MECHANICAL, ELECTRICAL AND/OR ARCHITECTURAL DRAWINGS FOR EMBEDMENT OF BOLTS, ANCHORS AND OTHER MISCELLANEOUS EMBEDDED ITEMS NOT SHOWN ON THESE STRUCTURAL DRAWINGS.

## BASIS OF DESIGN

1. THE FOLLOWING APPLIED LOADS, PER THE 2010 CBC, WERE USED IN THE DESIGN OF THE PROPOSED BUILDING:

WIND:	BASIC WIND SPEED = 110 MPH EXPOSURE C I = 1.0
SEISMIC:	I = 1.0 SEISMIC DESIGN CATEGORY = D SITE CLASS = D S <sub>s</sub> = 1.547      S <sub>1</sub> = 0.600 F <sub>a</sub> = 1.056      F <sub>v</sub> = 1.500 S <sub>ms</sub> = 1.031      S <sub>ds</sub> = 0.600 R = 3.0 DESIGN BASE SHEAR = 2.4k



NO.	REVISION	DATE

SHEET TITLE: LFG FLARING SYSTEM - STRUCTURAL NOTES

PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
BERKELEY LANDFILL  
BERKELEY CALIFORNIA

CLIENT: CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
1847 CENTER ST., 4TH FLOOR  
BERKELEY, CALIFORNIA 94704

**SCS ENGINEERS**  
ENVIRONMENTAL CONSULTANTS  
6601 KOLL CENTER PARKWAY SUITE 140  
PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 0121012.00  
DATE: 05-01-2012

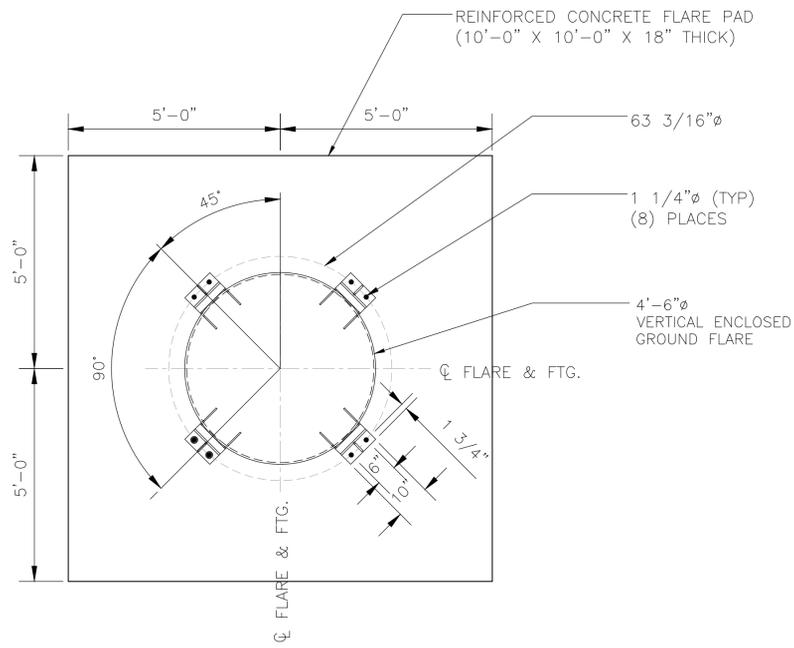
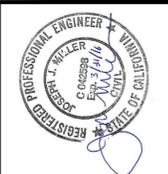
DRN. BY: R. RAMIREZ  
CHK. BY: S. KOTHARY

ACAD. FILE: N/2011  
APP. BY: J. MILLER

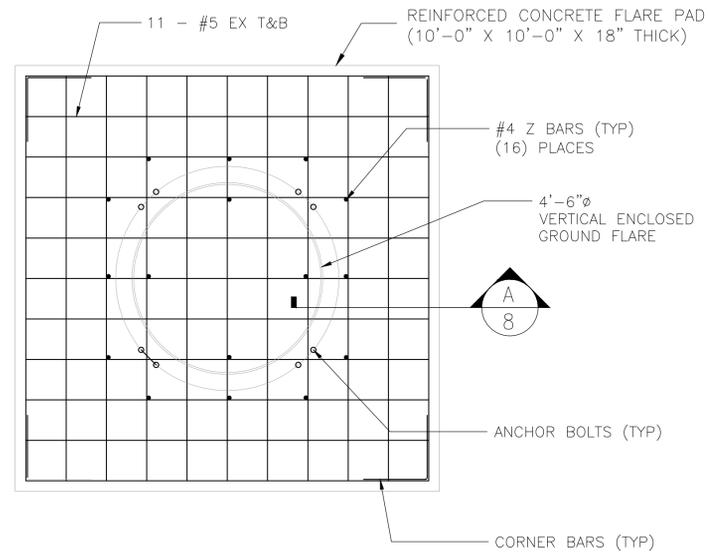
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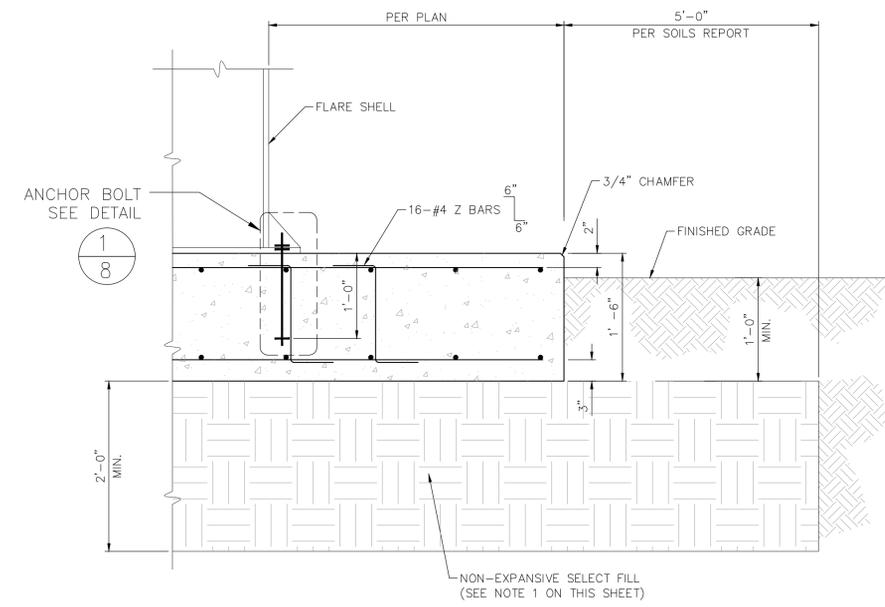
DRAWING NO.: 7



PLAN - ANCHOR BOLT LAYOUT  
SCALE: 1/2"=1'-0"



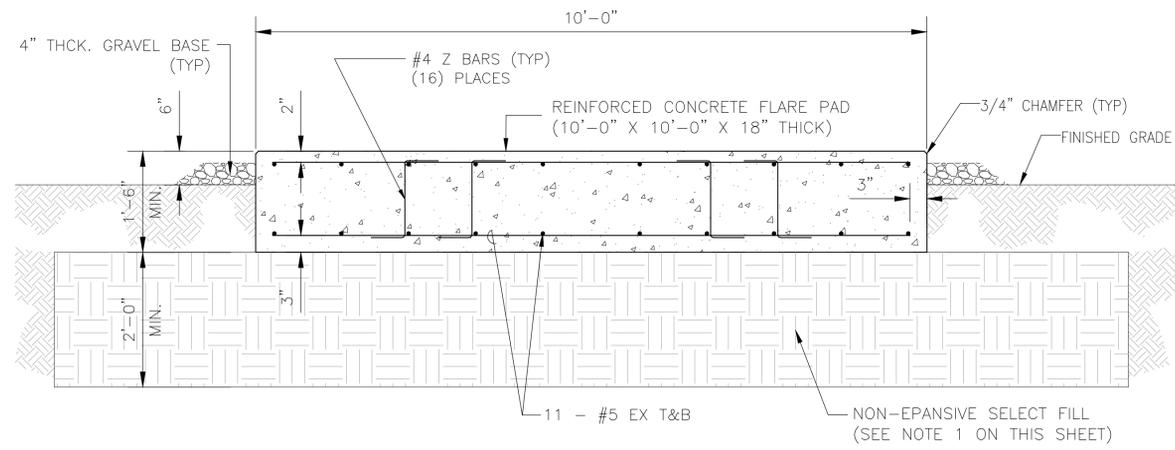
PLAN - FLARE PAD REINFORCEMENT  
SCALE: 1/2"=1'-0"



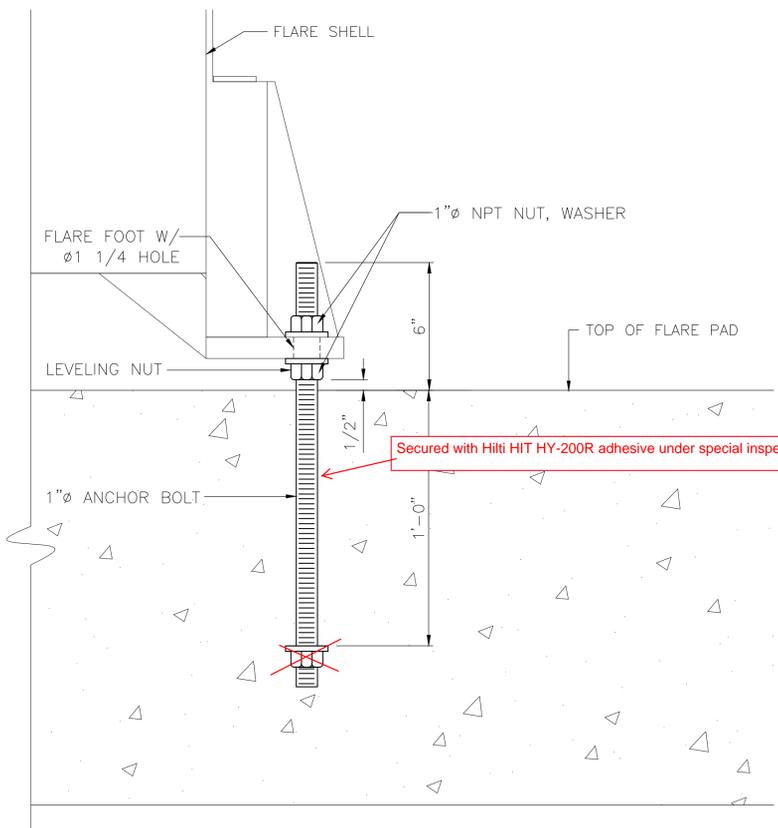
SECTION A-A  
N.T.S.

NOTE:

1. THE EXISTING POTENTIALLY EXPANSIVE SOIL AT THE NEW FLARE PAD LOCATION SHALL BE MITIGATED BY EXCAVATION AND REPLACEMENT WITH A MINIMUM OF 2 FEET OF NON-EXPANSIVE SELECT FILL BELOW THE BOTTOM OF THE FLARE PAD. THE NON-EXPANSIVE SELECT FILL SHALL EXTEND 5 FEET BEYOND THE PAD FOOTPRINT ON ALL SIDES AND SHALL CONSIST OF AGGREGATE BASE ROCK CONFORMING TO THE REQUIREMENTS OF CALTRANS CLASS 2 AGGREGATE BASE OR AN EQUIVALENT NON-EXPANSIVE MATERIAL, AS APPROVED BY THE GEOTECHNICAL ENGINEER. PRIOR TO PLACEMENT OF NON-EXPANSIVE SELECT FILL, THE FOUNDATION SUBGRADE, EXPOSED BY EXCAVATION, SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 90% AT A MOISTURE CONTENT OF OPTIMUM TO A MAXIMUM OF 3% ABOVE OPTIMUM IN ACCORDANCE WITH ASTM D-1557 (LATEST REVISION). SELECT NON-EXPANSIVE AGGREGATE BASE ROCK SHALL COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 95% PURSUANT TO ASTM D-1557 (LATEST REVISION). THE FILL SHALL BE SPREAD EVENLY AND COMPACTED IN UNIFORM LIFTS NOT EXCEEDING 8 INCHES IN UNCOMPACTED THICKNESS.

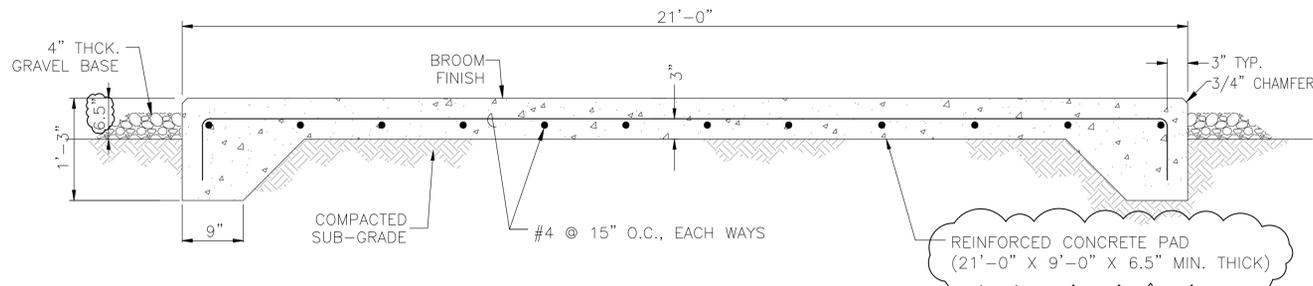


DETAIL - FLARE PAD  
N.T.S.

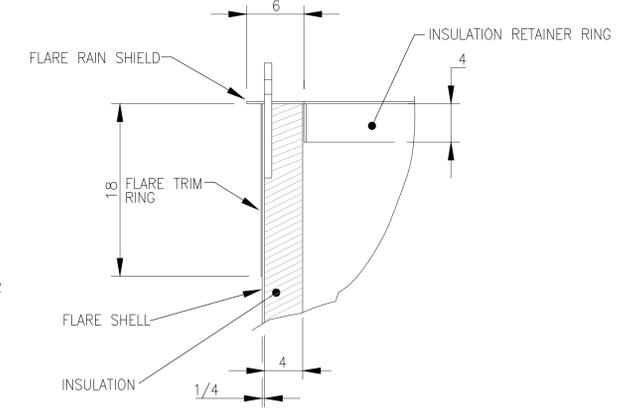


NOTE: REINFORCEMENT NOT SHOWN FOR CLARITY.

DETAIL - ANCHOR BOLT  
SCALE: 1/2"=1'-0"



DETAIL - BLOWER SKID PAD  
N.T.S.



DETAIL - TYPICAL FLARE STACK TOP SECTION  
N.T.S.

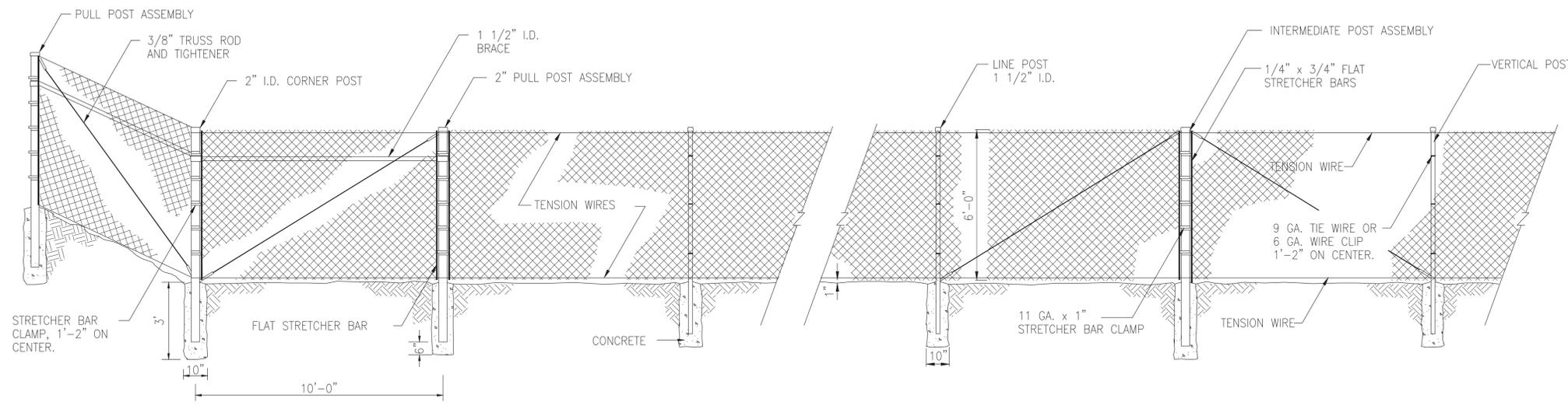
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REVISION	ISSUED FOR CONSTRUCTION
NO.	1

SHEET TITLE:	LFG FLARING SYSTEM - STRUCTURAL DETAILS
PROJECT TITLE:	UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY CALIFORNIA

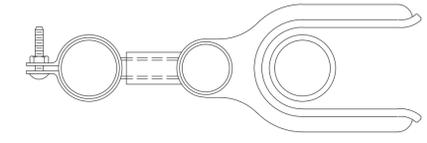
CLIENT:	CITY OF BERKELEY DEPARTMENT OF PUBLIC WORKS 1947 CENTER ST., 4TH FLOOR BERKELEY, CALIFORNIA 94704
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PROJ. NO.	01210112.00
DATE	05-01-2012
APP. BY:	R. RAMIREZ
CHK. BY:	S. KOTHARY
ACAD FILE:	11/2/2011
APP. BY:	B. J. MILLER

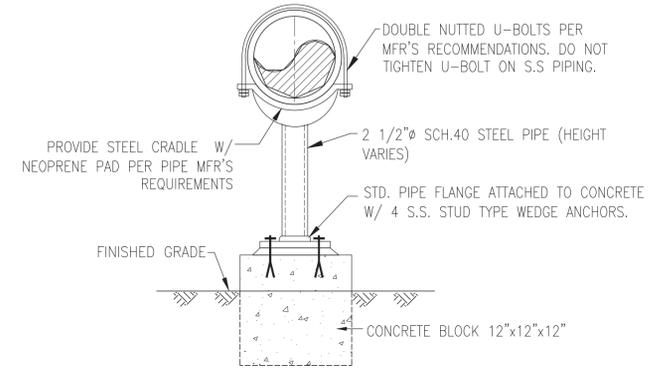
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SCALE:	AS SHOWN
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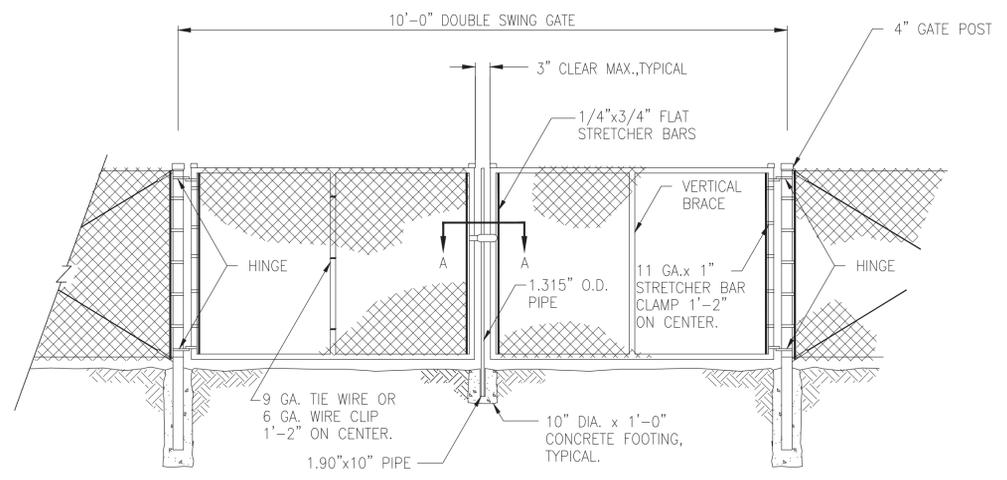
**DETAIL - TYPICAL 6'-0" HEIGHT CHAIN LINK FENCE W/GREEN VINYL SLATS**  
N.T.S.



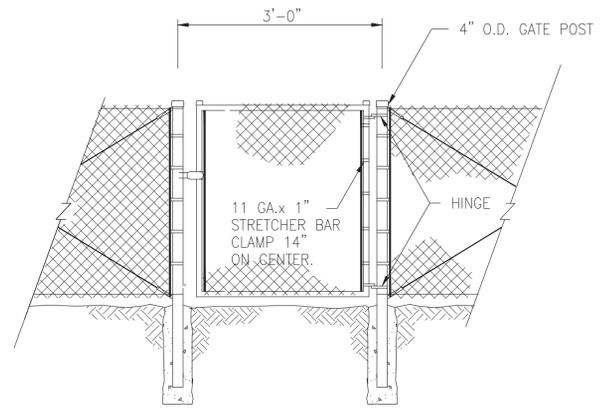
**DOUBLE GATE LATCH ASSEMBLY A-A**



**DETAIL - PIPE SUPPORT (TYP.) [PROVIDED BY CONTRACTOR]**  
N.T.S.

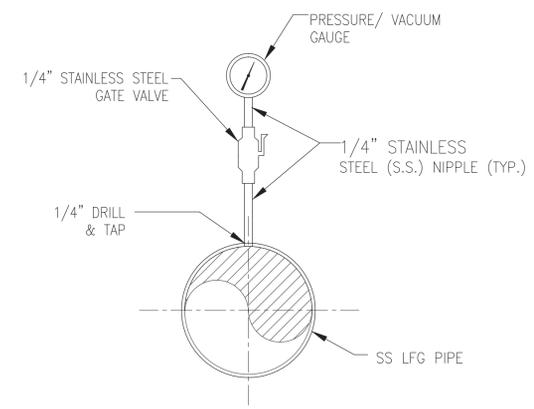


**DOUBLE SWING GATE**



**SINGLE SWING GATE**

**DETAIL - SWING GATES**  
N.T.S.



**DETAIL - GAUGE INSTALLATION**  
N.T.S.

DATE	
NO.	
REVISION	

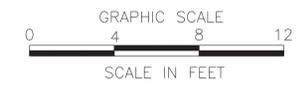
SHEET TITLE: CHAIN LINK FENCE AND GATE DETAILS  
PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY CALIFORNIA

CLIENT: CITY OF BERKELEY DEPARTMENT OF PUBLIC WORKS 1847 CENTER ST., 4TH FLOOR BERKELEY, CALIFORNIA 94704

**SCS ENGINEERS ENVIRONMENTAL CONSULTANTS**  
6601 KOLL CENTER PARKWAY SUITE 140 PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707  
DRAW. NO. 01210112.00  
DRAWN BY: R. RAMIREZ  
CHECKED BY: S. KOTHARY  
APP. BY: J. MILLER  
DATE: 05-01-2012

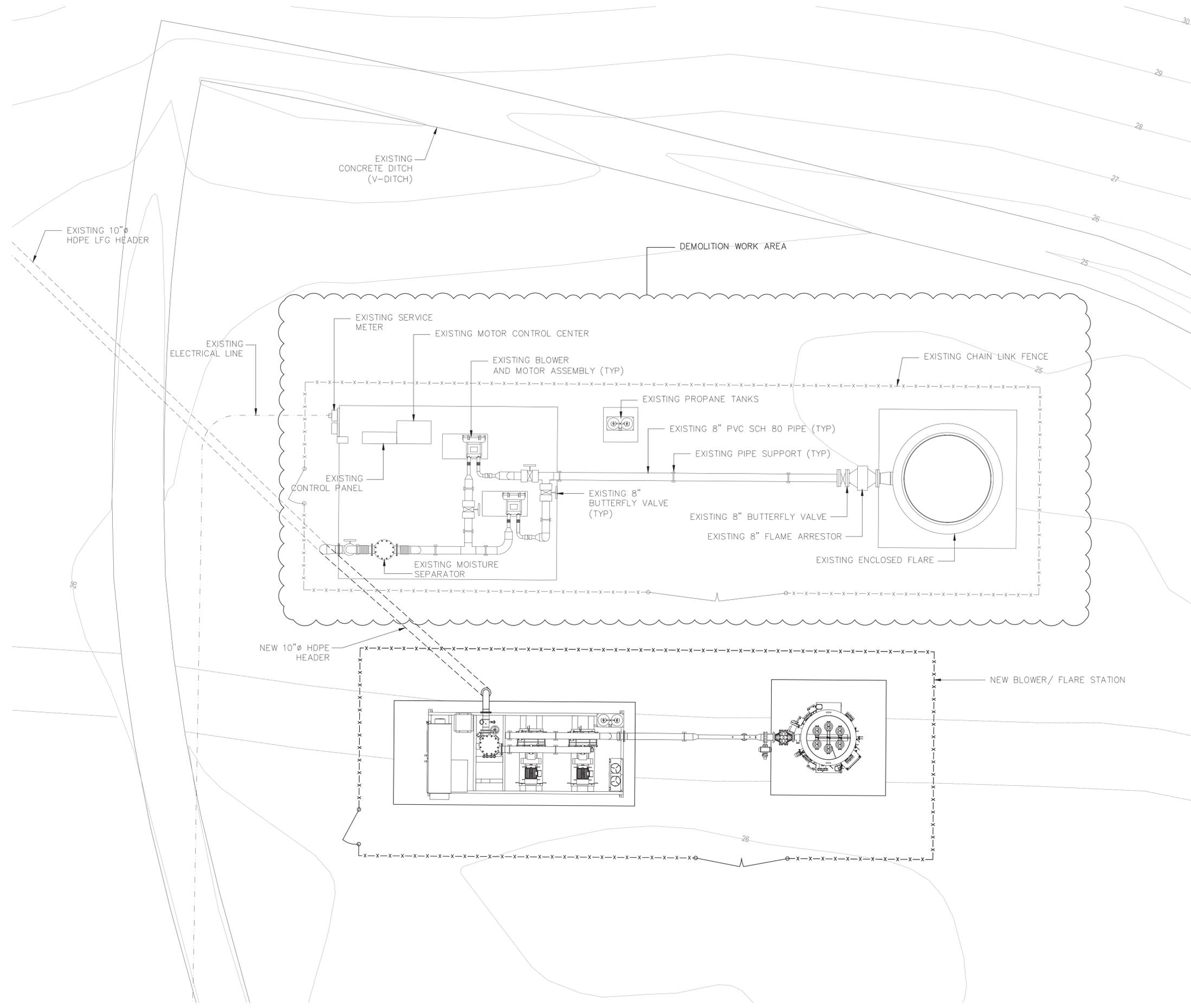
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DRAWING NO.: 9

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**LEGEND**

- 26 — EXISTING CONTOURS
- - - - - EXISTING ELECTRICAL LINE



**NOTES:**

1. EXISTING BLOWER/FLARE STATION PLAN REPRODUCED FROM AS-BUILTS DRAWINGS PROVIDED BY THE CITY.
2. THE DEMOLITION WORK SHALL COMMENCE ONLY AFTER THE NEW FLARING SYSTEM HAS BEEN TESTED SUCCESSFULLY AND PUT INTO OPERATION, EXISTING FLARING SYSTEM PUT OUT OF COMMISSION, AND ON WRITTEN AUTHORIZATION FROM THE CITY.
3. THE CONTRACTOR SHALL TAKE EXTRA PRECAUTIONS DURING DEMOLITION OF THE EXISTING FLARING SYSTEM TO PROTECT THE NEW FLARING SYSTEM.
4. ALL ITEMS WITHIN THE FENCED AREA OF THE EXISTING FLARE STATION SHALL BE DISMANTLED AND REMOVED FROM THE SITE, UNLESS SHOWN OTHERWISE AND AS SPECIFIED IN SECTION 02050, DEMOLITION - EXISTING BLOWER/FLARE STATION.
5. FINAL GRADING WORK SHALL COMMENCE ONLY AFTER DEMOLITION WORK IS COMPLETED AND ACCEPTED BY THE CITY.

**DEMOLITION PLAN - EXISTING BLOWER/ FLARE STATION**  
SCALE: 1/4"=1'-0"

NO.	REVISION	DATE

SHEET TITLE: DEMOLITION PLAN - EXISTING BLOWER/ FLARE STATION  
PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
BERKELEY LANDFILL  
BERKELEY CALIFORNIA

CLIENT: CITY OF BERKELEY  
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PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 01210112.00  
DSN. BY: S. KOTHARY  
DWN. BY: R. RAMIREZ  
ACAD. FILE: N/2011  
APP. BY: J. MILLER  
CHK. BY: S. KOTHARY

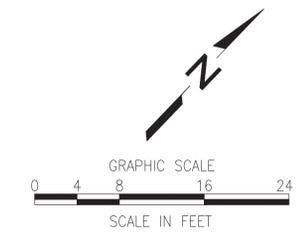
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SCALE: AS SHOWN

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N:\CAD\2011\01210112.00 - Berkeley LF\Design\Design 3 (FINAL with SEAL\_5-9-12)\Sheet 11 (Grading Plan).dwg May 30, 2012 - 1:50pm By: 2747r-r



**LEGEND**

	EXISTING CONTOUR
	FINAL GRADE CONTOUR

- NOTES:**
1. FINAL GRADING WORK SHALL COMMENCE ONLY AFTER DEMOLITION WORK IS COMPLETED AND ACCEPTED BY THE CITY.

**GRADING PLAN - BLOWER/ FLARE STATION**  
SCALE: 1/8"=1'-0"

EXISTING TOPOGRAPHIC PLAN IS FURNISHED BY HJW GEOSPATIAL, INC. THE TOPOGRAPHY DATA IS BASED ON NOVEMBER 4, 2010 AERIAL PHOTOGRAPHY.



NO.	REVISION	DATE

**SHEET TITLE:** LFG FLARING SYSTEM - GRADING PLAN  
**PROJECT TITLE:** UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY CALIFORNIA

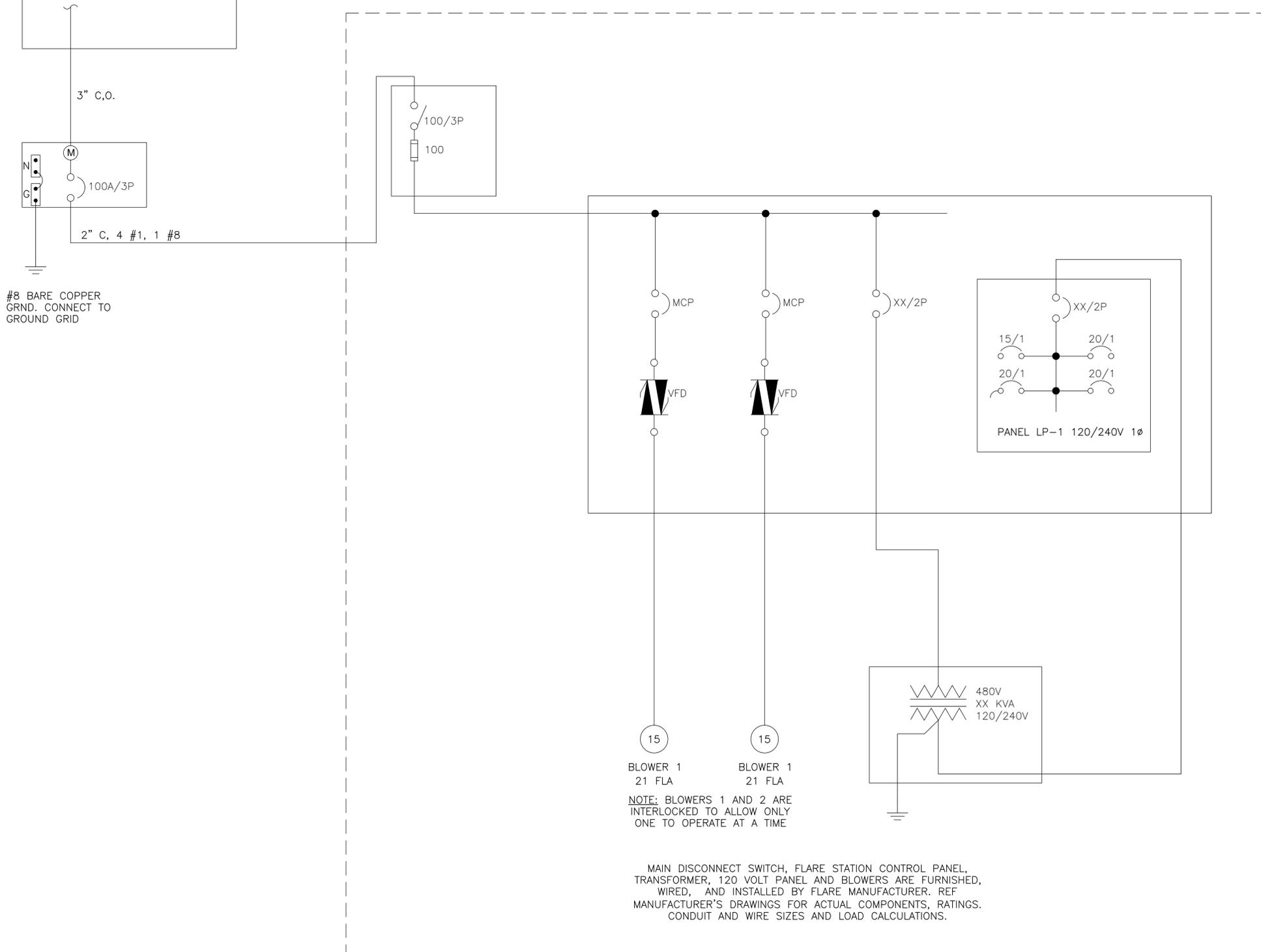
**CLIENT:** CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
1947 CENTER ST., 4TH FLOOR  
BERKELEY, CALIFORNIA 94704

**SCS ENGINEERS ENVIRONMENTAL CONSULTANTS**  
6601 KOLL CENTER PARKWAY SUITE 140  
PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707

DATE: 05-01-2012  
SCALE: AS SHOWN  
DRAWING NO.: 01210112.00

DRN. BY: S. KOTHARY  
CHK. BY: S. KOTHARY  
APP. BY: J. MILLER  
ACAD FILE: N/2011

INTERRUPT BOX AT EXISTING PG&E U.G. FEEDER TO EXISTING FLARE STATION (TO BE REMOVED). PG&E TO CONNECT NEW FLARE STATION FEEDER TO EXISTING U.G. FEEDER



#8 BARE COPPER GRND. CONNECT TO GROUND GRID

BLOWER 1  
21 FLA

BLOWER 1  
21 FLA

NOTE: BLOWERS 1 AND 2 ARE INTERLOCKED TO ALLOW ONLY ONE TO OPERATE AT A TIME

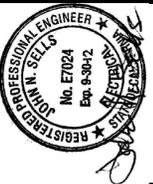
MAIN DISCONNECT SWITCH, FLARE STATION CONTROL PANEL, TRANSFORMER, 120 VOLT PANEL AND BLOWERS ARE FURNISHED, WIRED, AND INSTALLED BY FLARE MANUFACTURER. REF MANUFACTURER'S DRAWINGS FOR ACTUAL COMPONENTS, RATINGS, CONDUIT AND WIRE SIZES AND LOAD CALCULATIONS.

480V 3Ø LOAD SCHEDULE

LOAD	AMPS
BLOWER 1/BLOWER2	21
7.5 KVA TRANSF (PNL LP1)	15.6
TOTAL CONNECTED	36.6
25% LARGEST MOTOR	5.25
TOTAL LOAD	41.85

NOTES:

1. REFERENCE SHEET E-2 FOR FEEDER ROUTING, LOCATION OF EQUIPMENT AND GROUNDING PLAN.
2. REFERENCE SHEET E-3 ELECTRICAL DETAILS.
3. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT THE LOCATION, ORIENTATION OR RELATIONSHIP OF THE EQUIPMENT SHOWN.
4. ALL WIRE SHALL BE STRANDED COPPER, TYPE THHN/THWN.
5. THE TREATMENT SKID, INCLUDING THE CONTROL PANEL IS A PRE-ASSEMBLED, PRE-WIRED ITEM, FURNISHED BY OTHERS.
6. ALL BIDDERS SHOULD VISIT THE JOB SITE PRIOR TO SUBMITTING THEIR BID IN ORDER TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS.



NO.	REVISION	DATE

SHEET TITLE:  
LFG FLARING SYSTEM - SINGLE LINE DIAGRAM AND LOAD SCHEDULES

PROJECT TITLE:  
UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
BERKELEY LANDFILL  
BERKELEY CALIFORNIA

CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
1847 CENTER ST., 4TH FLOOR  
BERKELEY, CALIFORNIA 94704

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ENVIRONMENTAL CONSULTANTS  
6601 KOLL CENTER PARKWAY SUITE 140  
PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707

DRN. BY: J. RUBINO  
CHK. BY: S. KOTHARY  
APP. BY: J. MILLER

PROJ. NO: 0121012.00  
ACAD. FILE: N/2011

DATE: 05-01-2012

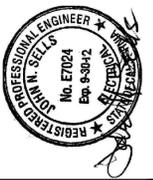
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DRAWING NO.:

E-1 12

JIM RUBINO  
4821 Burgundy Road  
Woodland Hills, CA 91364  
Tel (818) 225-7680  
Fax (818) 225-7681  
www.logcontrol.com

AUTOMATION & CONTROL SYSTEM DESIGN



DATE	
REVISION	
NO.	

SHEET TITLE: ELECTRICAL PLAN - LFG FLARING SYSTEM  
 PROJECT TITLE: UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
 BERKELEY LANDFILL  
 BERKELEY CALIFORNIA

CLIENT: CITY OF BERKELEY  
 DEPARTMENT OF PUBLIC WORKS  
 1847 CENTER ST., 4TH FLOOR  
 BERKELEY, CALIFORNIA 94704

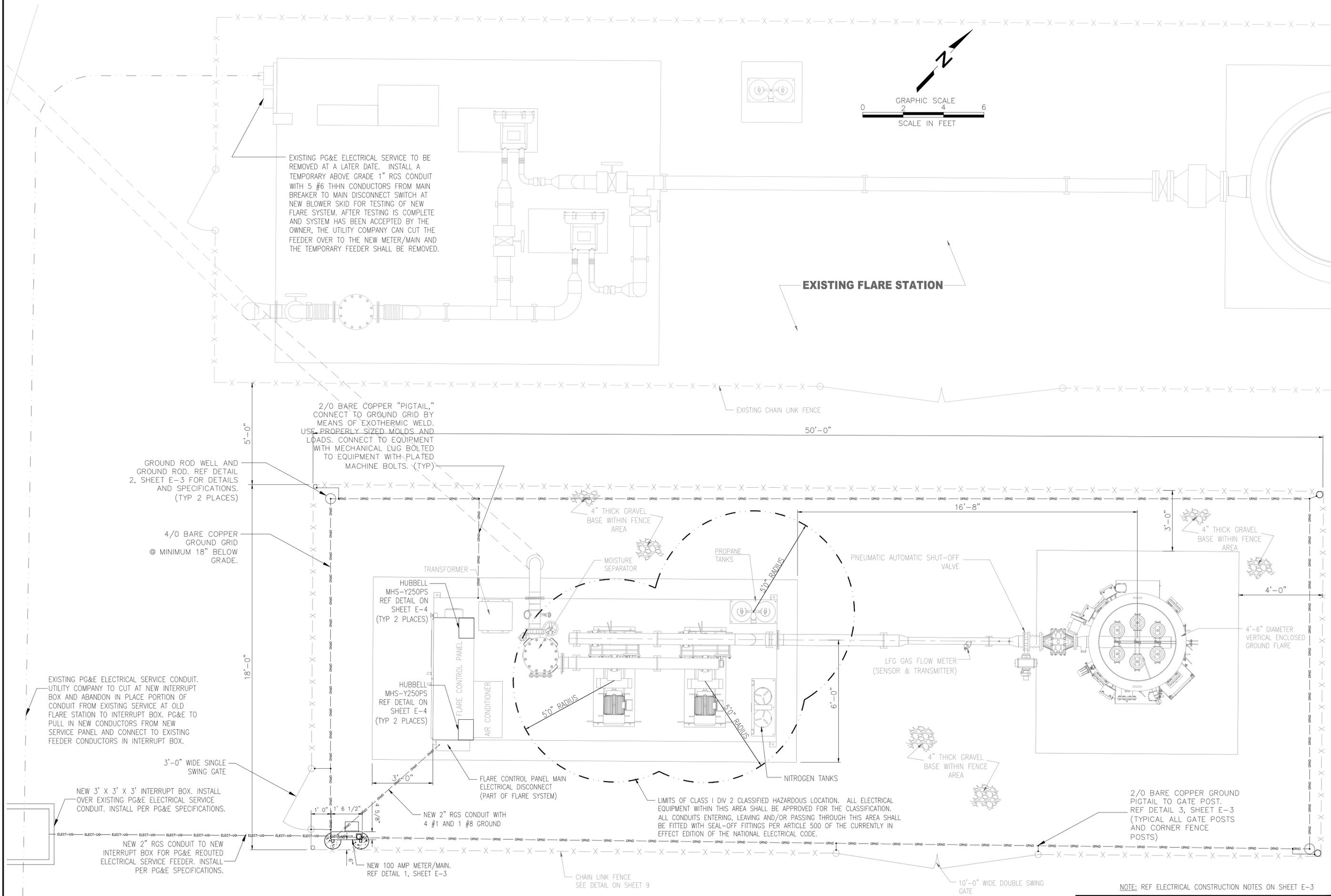
**SCS ENGINEERS**  
 ENVIRONMENTAL CONSULTANTS  
 6601 KOLL CENTER PARKWAY SUITE 440  
 PLEASANTON, CA 94566  
 PH. (925) 426-0080 FAX. (925) 426-0707  
 PROJ. NO. 01210112.00  
 DSN. BY: J. RUBINO  
 CHK. BY: S. KOTHARY  
 DATE: N/2011  
 APP. BY: J. MILLER

DATE: 05-01-2012

SCALE: AS SHOWN

DRAWING NO.:

E-2 13



EXISTING PG&E ELECTRICAL SERVICE TO BE REMOVED AT A LATER DATE. INSTALL A TEMPORARY ABOVE GRADE 1" RGS CONDUIT WITH 5 #6 THHN CONDUCTORS FROM MAIN BREAKER TO MAIN DISCONNECT SWITCH AT NEW BLOWER SKID FOR TESTING OF NEW FLARE SYSTEM. AFTER TESTING IS COMPLETE AND SYSTEM HAS BEEN ACCEPTED BY THE OWNER, THE UTILITY COMPANY CAN CUT THE FEEDER OVER TO THE NEW METER/MAIN AND THE TEMPORARY FEEDER SHALL BE REMOVED.

EXISTING FLARE STATION



GROUND ROD WELL AND GROUND ROD. REF DETAIL 2, SHEET E-3 FOR DETAILS AND SPECIFICATIONS. (TYP 2 PLACES)

4/0 BARE COPPER GROUND GRID  
 © MINIMUM 18" BELOW GRADE.

EXISTING PG&E ELECTRICAL SERVICE CONDUIT. UTILITY COMPANY TO CUT AT NEW INTERRUPT BOX AND ABANDON IN PLACE PORTION OF CONDUIT FROM EXISTING SERVICE AT OLD FLARE STATION TO INTERRUPT BOX. PG&E TO PULL IN NEW CONDUCTORS FROM NEW SERVICE PANEL AND CONNECT TO EXISTING FEEDER CONDUCTORS IN INTERRUPT BOX.

3'-0" WIDE SINGLE SWING GATE

NEW 3' X 3' X 3' INTERRUPT BOX. INSTALL OVER EXISTING PG&E ELECTRICAL SERVICE CONDUIT. INSTALL PER PG&E SPECIFICATIONS.  
 NEW 2" RGS CONDUIT TO NEW INTERRUPT BOX FOR PG&E REROUTED ELECTRICAL SERVICE FEEDER. INSTALL PER PG&E SPECIFICATIONS.  
 NEW 100 AMP METER/MAIN. REF DETAIL 1, SHEET E-3

2/0 BARE COPPER "PIGTAIL," CONNECT TO GROUND GRID BY MEANS OF EXOTHERMIC WELD. USE PROPERLY SIZED MOLDS AND LOADS. CONNECT TO EQUIPMENT WITH MECHANICAL LUG BOLTED TO EQUIPMENT WITH PLATED MACHINE BOLTS. (TYP)

HUBBELL MHS-Y250PS REF DETAIL ON SHEET E-4 (TYP 2 PLACES)  
 HUBBELL MHS-Y250PS REF DETAIL ON SHEET E-4 (TYP 2 PLACES)

FLARE CONTROL PANEL MAIN ELECTRICAL DISCONNECT (PART OF FLARE SYSTEM)

NEW 2" RGS CONDUIT WITH 4 #1 AND 1 #8 GROUND

LIMITS OF CLASS 1 DIV 2 CLASSIFIED HAZARDOUS LOCATION. ALL ELECTRICAL EQUIPMENT WITHIN THIS AREA SHALL BE APPROVED FOR THE CLASSIFICATION. ALL CONDUITS ENTERING, LEAVING AND/OR PASSING THROUGH THIS AREA SHALL BE FITTED WITH SEAL-OFF FITTINGS PER ARTICLE 500 OF THE CURRENTLY IN EFFECT EDITION OF THE NATIONAL ELECTRICAL CODE.

CHAIN LINK FENCE SEE DETAIL ON SHEET 9

2/0 BARE COPPER GROUND PIGTAIL TO GATE POST. REF DETAIL 3, SHEET E-3 (TYPICAL ALL GATE POSTS AND CORNER FENCE POSTS)

NOTE: REF ELECTRICAL CONSTRUCTION NOTES ON SHEET E-3

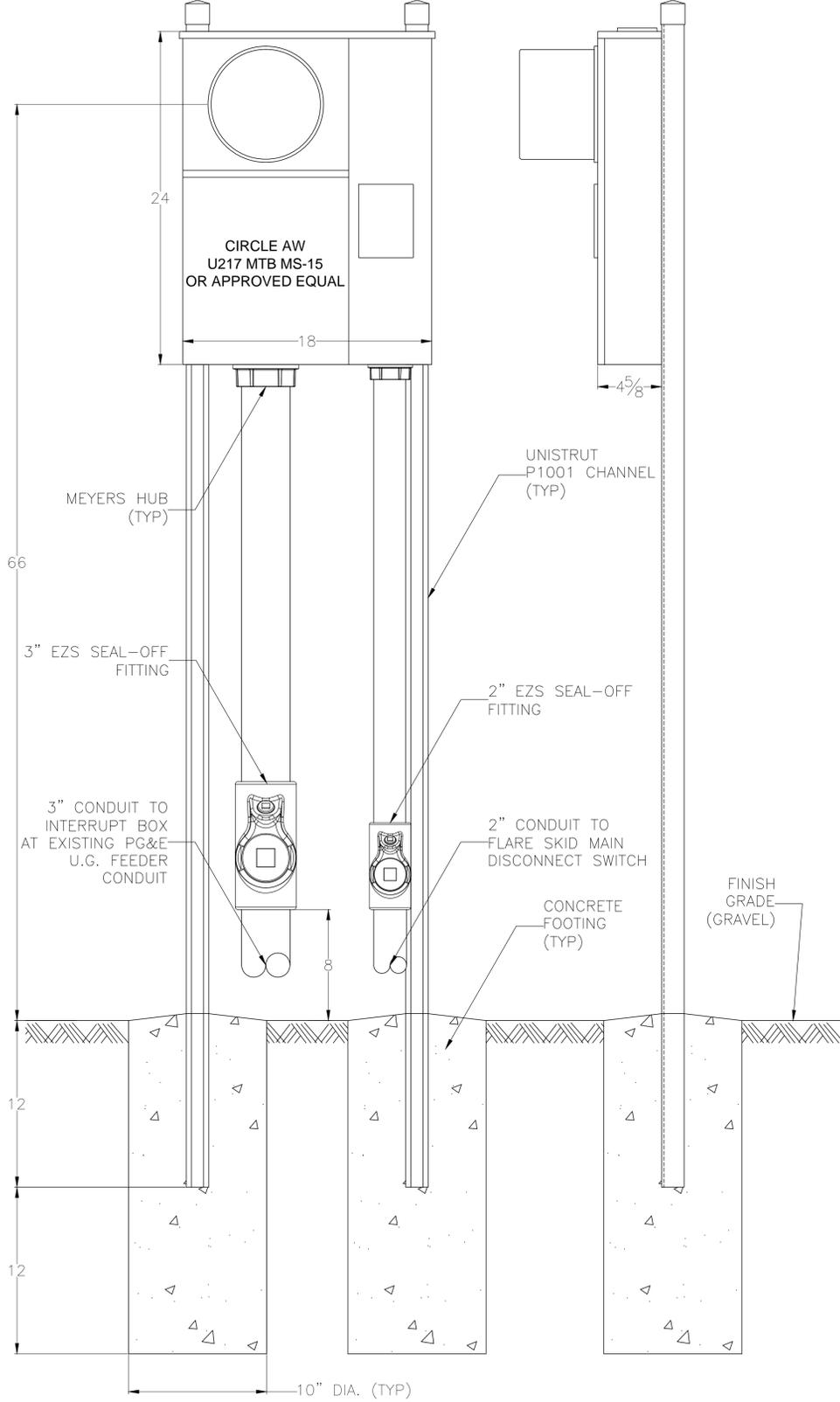
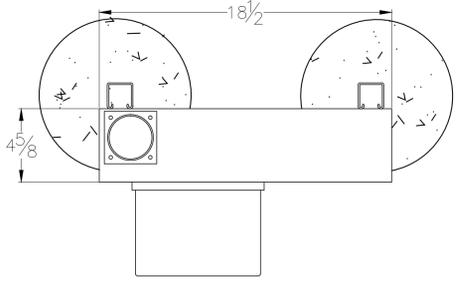
**PLAN - LFG FLARING SYSTEM**

SCALE: USE GRAPHIC SCALE ATTACHED

JIM RUBINO  
 AUTOMATION & CONTROL SYSTEM DESIGN  
 4821 Burgundy Road  
 Woodland Hills, CA 91364  
 Tel (818) 225-7680  
 Fax (818) 225-7681  
 www.logiccontrol.com

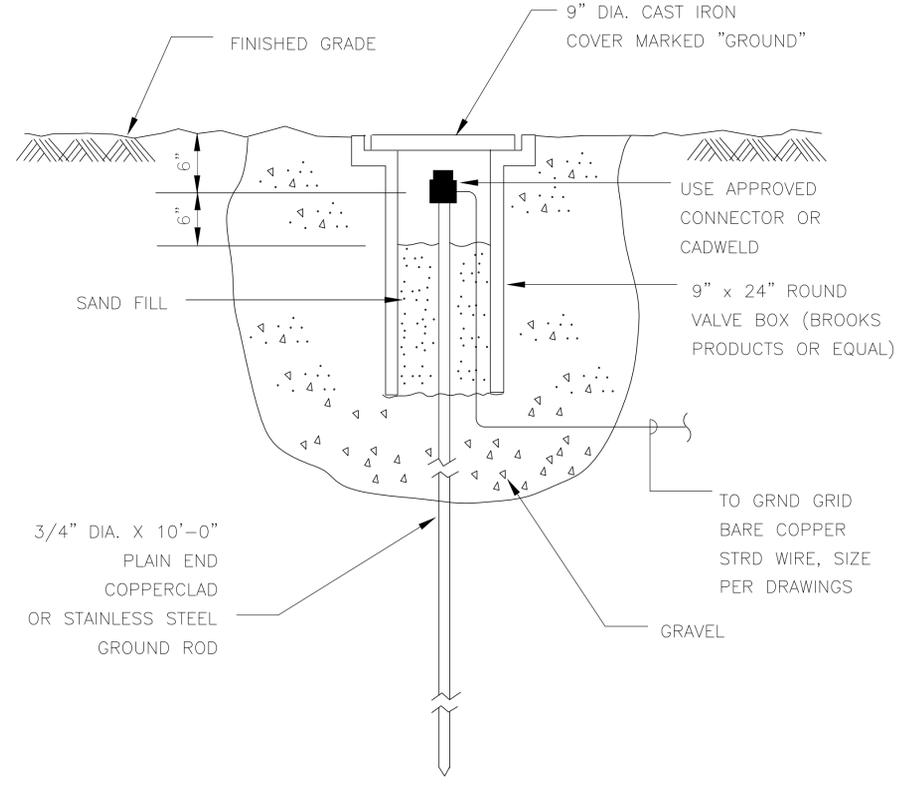
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N:\CAD\2011\01210112.00 - Berkeley LF\Design\Design 3 (FINAL with SEAL\_5-9-12)\Sheet E-3 (Electrical Details).dwg May 30, 2012 - 1:5pm By: 2747\_r



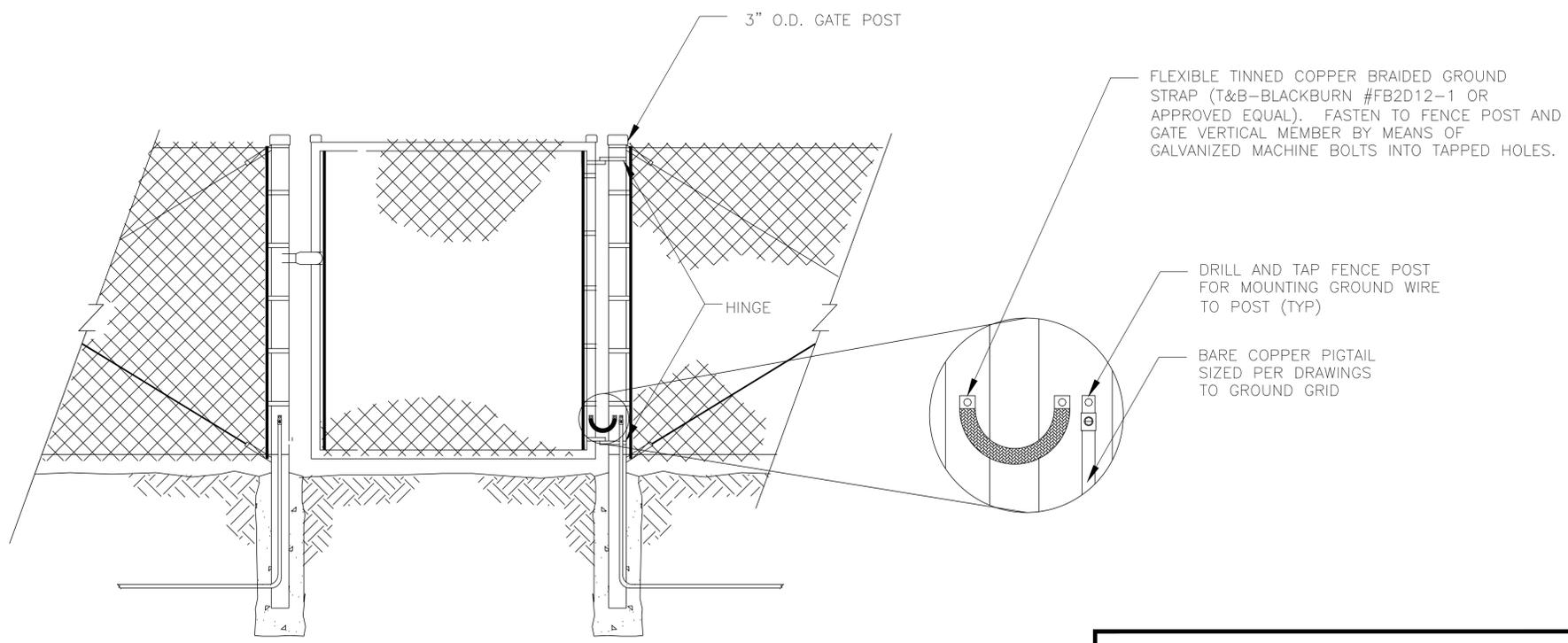
**UTILITY SERVICE PANEL ELEVATION**  
NTS

1  
E-3



**GROUND ROD WELL AND ROD DETAIL**  
NTS

2  
E-3

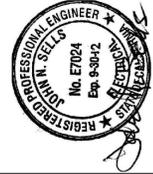


**FENCE GATE POST GROUNDING DETAIL**  
NTS

3  
E-3

**NOTES:**

1. REFERENCE SHEET E-2 FOR LOCATION OF GROUND GRID, GROUND RODS AND GROUND ROD WELLS, METER/MAIN PANEL AND ALL OTHER EQUIPMENT. CONTRACTOR SHALL EXTEND A 2/0 GROUNDING PIGTAIL FROM THE GROUND GRID TO THE METER/MAIN PANEL AND MAKE ALL GROUNDING AND BONDING CONNECTIONS AS REQUIRED BY THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE AND/OR THE CALIFORNIA ELECTRICAL CODE.
2. REFERENCE SHEET E-1 FOR CONDUIT AND WIRE SIZES.
3. ALL UNISTRUT, UNISTRUT FITTINGS AND SPRING NUTS SHALL BE GALVANIZED. ALL ASSEMBLY BOLTS, WASHERS AND LOCK WASHERS SHALL BE 3/8" OR 1/2" STAINLESS STEEL.
4. FENCE GATE POST GROUNDING IS SHOWN FOR A SINGLE GATE ENTRY, DOUBLE GATE ENTRIES AND OTHER FENCE POSTS WILL USE SIMILAR GROUNDING METHODS AND MATERIALS.
5. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL (RGS). THE AREA BELOW GRADE IS CLASSIFIED AS HAZARDOUS, CLASS I DIV 1. ALL WIRING IN THIS CLASSIFIED AREA SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE AND/OR THE CALIFORNIA ELECTRICAL CODE. SEALOFF FITTINGS SHALL BE INSTALLED ON ALL UNDERGROUND CONDUITS EXTENDING ABOVE GRADE AT ±8" ABOVE GRADE. ALL CONDUIT JOINTS AND TERMINATIONS SHALL BE MADE WITH THREADED FITTINGS.
6. SPECIFICATIONS FOR AND INSTALLATION OF THE NEW INTERRUPT BOX AND SERVICE CONDUIT SHALL COMPLY WITH ALL REQUIREMENTS OF THE UTILITY COMPANY (PG&E).
7. THE FLARE BLOWER SKID IS PRE-ASSEMBLED AND PRE-WIRED BY THE FLARE MANUFACTURER. FLARE MANUFACTURER WILL COIL SUFFICIENT WIRE AND CABLE TO EXTEND FROM THE SKID TO THE LANDFILL GAS VALVE AND THE FLARE. THE CONTRACTOR SHALL FURNISH AND INSTALL THE REQUIRED CONDUITS, PULL-IN AND MAKE THE FINAL TERMINATIONS OF THE COILED CABLES AND WIRES AS DIRECTED BY THE FLARE MANUFACTURER.



NO.	REVISION	DATE

SHEET TITLE:  
**LFG FLARING SYSTEM - ELECTRICAL DETAILS**

PROJECT TITLE:  
**UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM BERKELEY LANDFILL BERKELEY CALIFORNIA**

CLIENT:  
**CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
1847 CENTER ST., 4TH FLOOR  
BERKELEY, CALIFORNIA 94704**

**SCS ENGINEERS**  
ENVIRONMENTAL CONSULTANTS  
6601 KOLL CENTER PARKWAY SUITE 140  
PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707

DATE: 01/21/12  
DWN. BY: J. RUBINO  
CHK. BY: S. KOTHARY  
APP. BY: J. MILLER

DATE: 05-01-2012

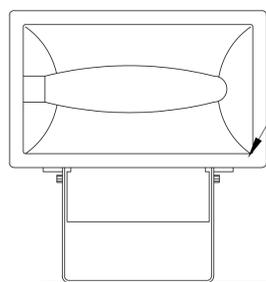
SCALE: AS SHOWN

DRAWING NO.: E-3 14

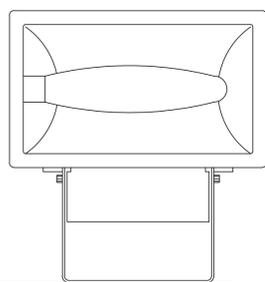
4821 Burgundy Road  
Woodland Hills, CA 91364  
Tel (818) 225-7680  
Fax (818) 225-7691  
www.logicontrol.com

**JIM RUBINO**

**AUTOMATION & CONTROL SYSTEM DESIGN**



HUBBELL MHS-Y250P8  
(TYP 2 PLCS)



FLARE MOTOR CONTROL PANEL  
(VIEWED FROM REAR)

6

6

A

A

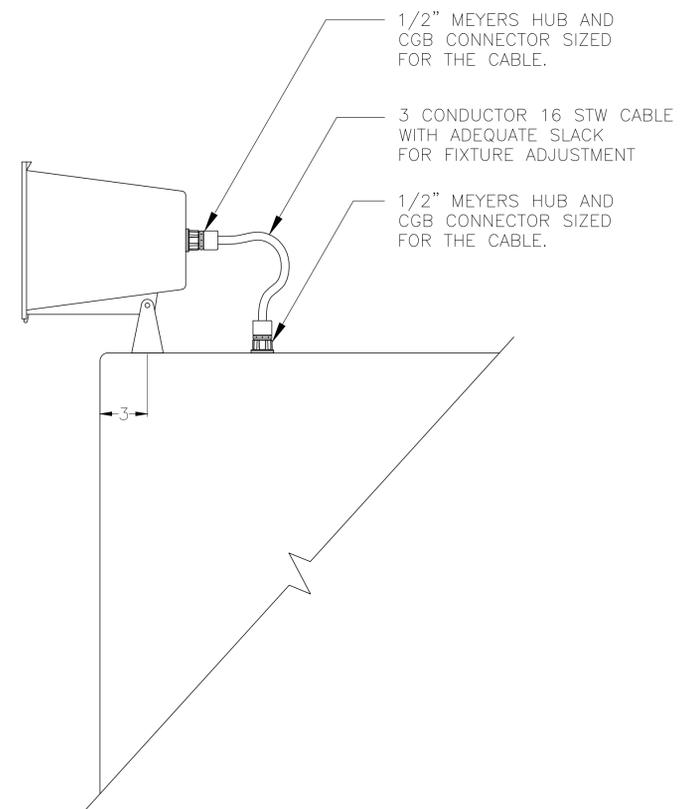
**BLOWER SKID LIGHTING DETAIL**

NTS

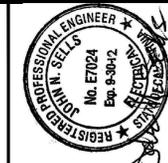
1  
E-4

**NOTES:**

1. FIXTURES SHALL BE BOLTED TO TOP OF CONTROL PANEL WITH (2) 1/2" STAINLESS STEEL BOLTS, WASHERS, LOCKWASHERS AND NUTS.
2. SILICONE CAULKING COMPOUND SHALL BE USED BETWEEN FIXTURE MOUNTING YOKE AND TOP OF CONTROL PANEL. SILICONE COMPOUND SHALL ALSO BE APPLIED AT BOLTS AND WASHERS TO ENSURE THERE WILL BE NO LEAKAGE INTO PANEL.
3. FIXTURES SHALL BE ANCHORED AND ANGLED AS DIRECTED BY PROJECT ENGINEER.
4. LIGHT SWITCH SHALL BE ENCLOSED IN A CAST FERRALOY BOX (FS SERIES) WITH WEATHERPROOF COVER. SWITCH SHALL BE LOCATED ON THE SOUTH END OF THE CONTROL PANEL, NEAR THE MAIN DISCONNECT SWITCH AS DIRECTED BY THE PROJECT ENGINEER.
5. LIGHTS SHALL BE CONNECTED TO SPARE 15 OR 20 AMP BREAKER IN THE 120 VOLT PANEL FURNISHED AS PART OF THE CONTROL PANEL.



**SECTION A-A**



NO.	REVISION	DATE

SHEET TITLE:  
**LFG FLARING SYSTEM - ELECTRICAL DETAILS**

PROJECT TITLE:  
**UPGRADE OF EXISTING LANDFILL GAS COLLECTION AND FLARING SYSTEM  
BERKELEY LANDFILL  
BERKELEY CALIFORNIA**

CLIENT:  
**CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
1947 CENTER ST., 4TH FLOOR  
BERKELEY, CALIFORNIA 94704**

**SCS ENGINEERS**  
ENVIRONMENTAL CONSULTANTS  
6601 KOLL CENTER PARKWAY SUITE 140  
PLEASANTON, CA 94566  
PH. (925) 426-0080 FAX. (925) 426-0707

DATE: 01/20/12.00  
DWN. BY: J. RUBINO  
CHK. BY: S. KOTHARY  
APP. BY: J. MILLER

DATE: 05-01-2012

SCALE: AS SHOWN

DRAWING NO.: E-4 15

**JIM RUBINO**  
 AUTOMATION & CONTROL SYSTEM DESIGN  
 4821 Burgundy Road  
 Woodland Hills, CA 91364  
 Tel (818) 225-7680  
 Fax (818) 225-7681  
 www.logicontrol.com

N:\CAD\2011\01210112.00 - Berkeley LF\Design\Design 3 (FINAL with SEAL\_5-9-12)\Sheet E-4 (Electrical Details).dwg May 30, 2012 - 1:5pm By: 2747\_r

# LFG Extraction Well Control Valve Depths

## City of Berkeley Landfill

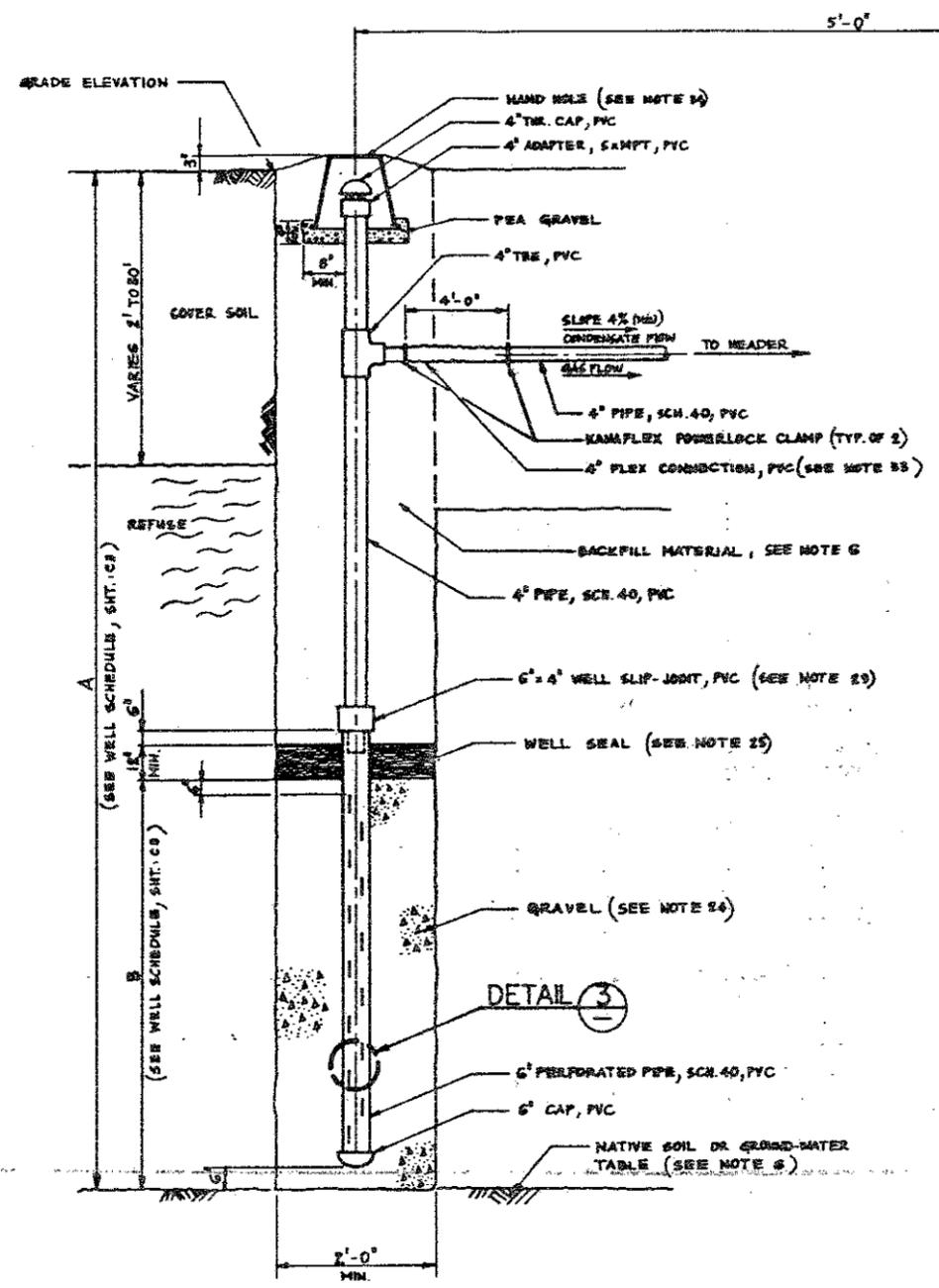
Extraction Well No.	Measured Valve Depth feet bgs	Extraction Well No.	Measured Valve Depth feet bgs
EW-01	2.0	EW-22	9.5
EW-02	1.0	EW-23	---
EW-03	3.0	EW-24	4.0
EW-04	4.0	EW-25	6.0
EW-05	5.5	EW-26	6.0
EW-06	3.0	EW-27	8.0
EW-07	4.0	EW-28	8.0
EW-08	---	EW-29	Unable to locate
EW-09	<del>Modification not required</del> 4.0	EW-30	5.0
EW-10	<del>Modification not required</del> 4.0	EW-31	8.0
EW-11	3.0	EW-32	10.0
EW-12	---	EW-33	Condensate trap (not EW)
EW-13	Modification not required	EW-34	7.0
EW-14	---	EW-35	---
EW-15	4.0	EW-36	7.0
EW-16	4.0	EW-37	7.0
EW-17	3.0	EW-38	6.0
EW-18	Modification not required	EW-39	6.0
EW-19	2.0	EW-40	5.0
EW-20	9.0	EW-41	5.0
EW-21	12.0	EW-42	5.0

Notes: Depths measured in field at control valve riser location May 19, 2015, to nearest 0.5 feet.

--- = depth not measured

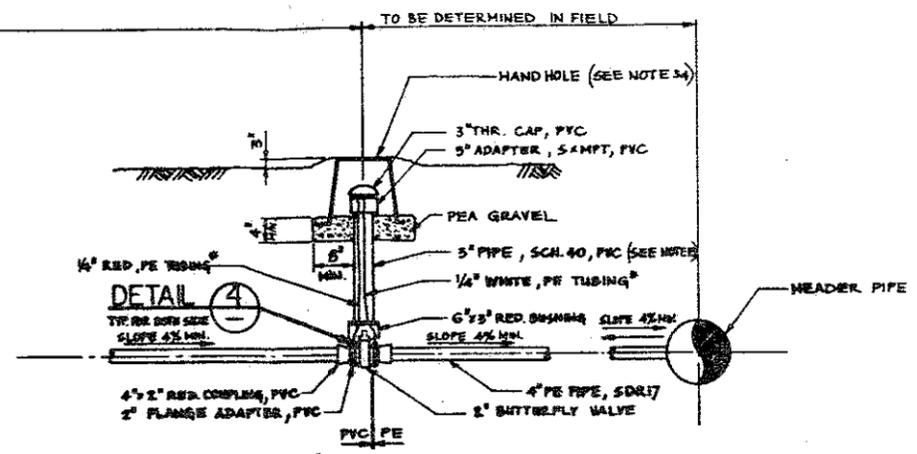
As-Built Plans: LFG Wells and South of Spinnaker Way

Well Number	Coordinates		Dimension (ft)		As-Built Dimensions (ft)	
	North	East	A	B	Well Depth	Perforation Interval
1	504,195	1,476,410	19	7		
2	504,140	1,476,170	21	9		
3	504,105	1,475,875	32	20		
4	504,080	1,475,670	34	32		
5	503,980	1,475,395	28	16		
6	504,040	1,574,125	30	18		
7	504,150	1,474,885	36	24		
8	504,370	1,475,735	32	20		
9	504,360	1,475,920	30	18		
10	504,295	1,475,685	54	42		
11	504,550	1,475,810	31	19		
12	504,720	1,475,620	30	18		
13	504,490	1,475,575	41	29		
14	504,555	1,475,330	45	33		
15	504,300	1,475,220	50	38		
16	504,295	1,475,425	50	38		
17	504,555	1,475,070	46	34		
18	504,430	1,474,915	48	36		
19	504,980	1,475,855	21	9		
20	505,050	1,475,530	38	26		
21	505,090	1,475,325	42	30		
22	504,860	1,475,140	35	23		
23	505,065	1,475,070	44	32		
24	504,785	1,474,915	47	35		
25	505,840	1,474,850	56	44		
26	504,870	1,474,670	54	42		
27	505,130	1,474,645	63	51		
28	504,850	1,474,440	39	27		
29	505,175	1,474,390	58	46		
30	505,010	1,474,285	34	22		
31	505,220	1,474,135	38	26		
32	505,238	1,475,620	33	21		
33	505,320	1,475,300	33	21		
34	505,540	1,475,185	36	24		
35	505,275	1,475,080	42.5	30.5		
36	505,490	1,474,940	40	28		
37	505,295	1,474,835	50	38		
38	505,320	1,474,590	42	30		
39	505,595	1,474,435	33	21		
40	505,360	1,474,390	58	46		
41	505,565	1,474,215	43	31		
42	505,415	1,474,100	50	38		
43	505,790	1,474,730	27	15		
44	505,690	1,475,110	15	5		
45	505,580	1,475,570	20	8		
46	505,600	1,474,500	22	10		
47	504,580	1,476,050	28	16		



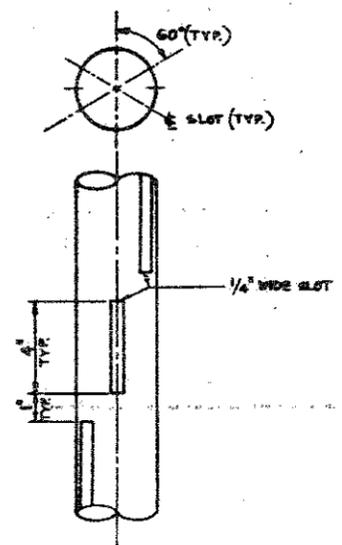
EXTRACTION WELL

DETAIL 1



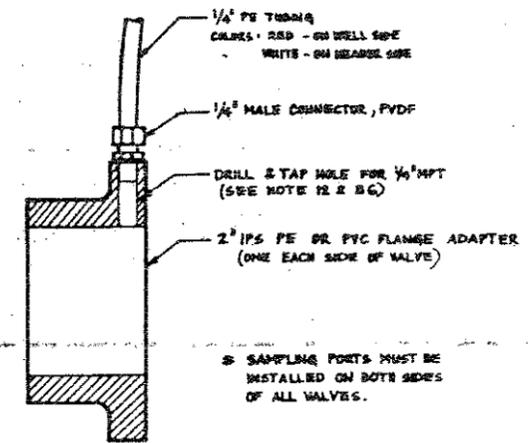
LATERAL

DETAIL 2



PERFORATION

DETAIL 3



SAMPLING PORT

DETAIL 4

NOTES:

- THE DIMENSIONS GIVEN ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. WELLS SHALL BE DRILLED TO BOTTOM OF REFUSE, WATER TABLE OR NATIVE SOIL, WHICHEVER IS ENCOUNTERED FIRST. DIMENSIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO CASING THE WELL. SEE CONSTRUCTION NOTE 6.
- AS-BUILT DIMENSIONS SHALL BE FURNISHED TO THE CLIENT.
- PERFORATION INTERVAL IS THE WELL DEPTH -13' UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
- EXISTING WELLS INSTALLED 4/21 '83 & 4/28/88 BY HARDING LAWSON ASSOCIATES.
- EXPLORATORY WELLS (A-E) SHALL BE DRILLED FIRST TO DETERMINE IF THERE IS SUFFICIENT REFUSE FOR INSTALLATION. IF THERE IS A LAYER REFUSE 10 FEET OR GREATER IN DEPTH THEN THE WELL SHALL BE INSTALLED AND CONNECTED TO THE HEADER PIPING. OTHERWISE THE WELL SHOULD BE BACKFILLED ACCORDING TO CONSTRUCTION NOTE 6, ON DWG. I.C.E.



SUBMITTED: _____	DATE: R.C.E. 18005	RECOMMEND APPROVAL: _____	DATE: R.C.E. 022618	DESIGN: _____	HORIZ: _____	CITY OF BERKELEY	NORTH WATERFRONT PARK	PLAN 5814
SENDER CIVIL ENGINEER	EXP: _____	ASSISTANT CITY ENGINEER	EXP: _____	DRAWN: _____	VERT: _____	DEPARTMENT OF PUBLIC WORKS	BERKELEY LANDFILL	FILE 406-71
		APPROVED: _____	DATE: R.C.E. 25573	CHECK: _____	BOOK: _____		Gas Testing & Monitoring System	SHEET 4 OF 6
		ASST. CITY MGR. FOR PUBLIC WORKS	EXP: 3/31/92	AS BUILT: _____	DATE: _____			

SCALE: NOT TO SCALE	DESIGNED BY: K. EICHSTAEDT	DATE: _____
DRAWN BY: A. KATANICS	CHECKED BY: S. Alvarado	DATE: 8/25/88
RECORD DRAWING	APPROVED BY: _____	DATE: _____
ISSUED FOR CONSTRUCTION		

**HLA** Harding Lawson Associates  
Engineers and Geoscientists  
P.O. Box 578  
Novato, California  
415/892-0521

CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
2001 ADAMS ST BERKELEY CA 94704

WELL AND LATERAL DETAILS  
NORTH WATERFRONT PARK  
BERKELEY LANDFILL

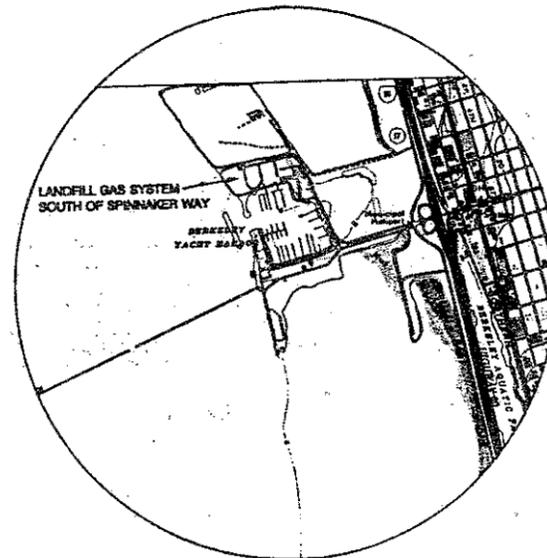
JOB NO.: 02106,015.02	REV.: 1
DRAWING NO.: C3	



# LANDFILL GAS COLLECTION SYSTEM SOUTH OF SPINNAKER WAY BERKELEY MARINA

## CLIENT

CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
2001 ADDISON ST.  
BERKELEY, CALIFORNIA 94704



VICINITY MAP

## ENGINEER

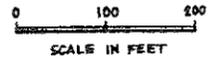
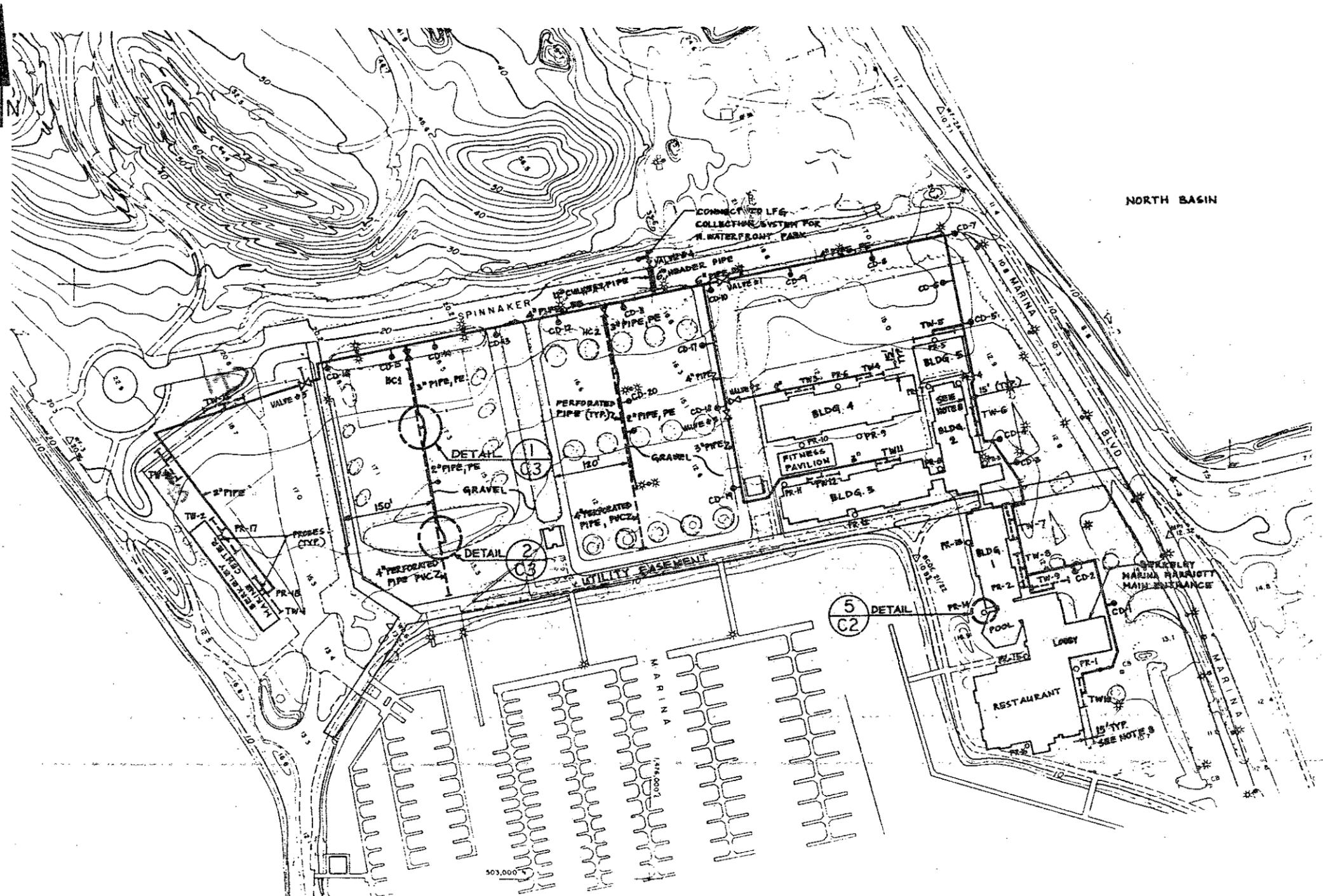
HARDING LAWSON ASSOCIATES  
P.O. BOX 578  
NOVATO, CALIFORNIA 94948

## DRAWING INDEX

- C1 - SITE PLAN
- C2 - NOTES
- C3 - DETAILS
- C4 - DETAILS
- C5 - DETAILS



SUBMITTED: <i>Harding J. Lawson Jr.</i> SENIOR CIVIL ENGINEER	DATE: 8/13/88 R.C.E.: 18,202 EXP.: 8/12/91	RECOMMEND APPROVAL: <i>[Signature]</i> ASSISTANT CITY ENGINEER	DATE: 8/13/88 R.C.E.: 20,627 EXP.: 8/13/89	DESIGN: _____ DRAWN: _____ CHECK: _____ AS BUILT: _____	HORIZ: _____ VERT: _____ BOOK: _____ DATE: _____	CITY OF BERKELEY DEPARTMENT OF PUBLIC WORKS	SOUTH OF SPINNAKER WAY BERKELEY LANDFILL Gas Testing & Monitoring Systems	PLAN: 6927 FILE: 406-74 SHEET: 1 of 6
---	--	--	--	--	---	--	---	---



**LEGEND**

- NC HORIZONTAL COLLECTOR
- TW TRENCH WELL
- PROBE
- ROAD CROSSING
- SOLID COLLECTOR PIPING
- PERFORATED PIPING
- CONDENSATE DRAIN (SEE NOTE 18 AND 19)



SUBMITTED: <i>Robert J. Lister Jr.</i> SENIOR CIVIL ENGINEER	DATE: 8/27/89 R.C.E. 18225 EXP. 6/30/89	RECOMMEND APPROVAL: <i>[Signature]</i> ASSISTANT CITY ENGINEER	DATE: 12/9/88 R.C.E. 22675 EXP. 12/31/88	DESIGN: _____ DRAWN: _____ CHECK: _____ AS BUILT: _____	HORIZ. _____ VERT. _____ BOOK _____ DATE _____	<b>CITY OF BERKELEY</b> DEPARTMENT OF PUBLIC WORKS	<b>SOUTH OF SPINNAKER WAY</b> <b>BERKELEY LANDFILL</b> Gas Testing & Monitoring System	PLAN 6927 FILE 406-74 SHEET 2 OF 6
--	---	--	--	--	---	---	--	--

SCALE 1"=100' DESIGNED BY: K.E. EICHSTAEDT DRAWN BY: A. KATANICS CHECKED BY: <i>[Signature]</i> DATE: 8/11/89 APPROVED BY: <i>[Signature]</i>	<b>Harding Lawson Associates</b> Engineers and Geoscientists P.O. Box 578 Novato, California (415) 892-0821
--	---

<b>CITY OF BERKELEY</b> DEPARTMENT OF PUBLIC WORKS 300 ALDEAN ST. BERKELEY, CA 94704	<b>SITE PLAN</b> LANDFILL GAS COLLECTION SYSTEM SOUTH OF SPINNAKER WAY
--	--

JOB NO.: 2106,024.02	REV.: 1
DRAWING NO.: C1	

**GENERAL NOTES**

See the Technical Specifications prepared by the Engineer for all applicable details on each of the following.

The following terms used herein are defined as follows:

- Contractor - Firm selected for construction of landfill gas control system
- Engineer - Harding Lawson Associates, San Eichenstadt, 415/892-0421.
- Owner - City of Berkeley, 415/644-6540
- Marriott - Berkeley Marina Marriott, Roger Donnell/Chief Engineer 415/892-7920
- Berkeley Marina Center - Berkeley Marina Center, Inc., Jim Lucas, 415/892-0821

1. Topographic base map utilized in preparation of the overall plan (Drawing C-1) shows coordinates, contours, and elevations which have been photogrammetrically updated from aerial photography dated July 17, 1986. Contour elevations in bold indicate July 17, 1986 conditions. Horizontal and vertical control was established by Towill, Inc. The scale is 1 inch = 100 feet. Zero elevation is equal to mean lower low water level.
2. Contractor shall comply with all safety requirements stated in the contract documents.
3. Contractor shall verify contours and elevations wherever necessary and shall be aware of the present topographic conditions, existing installations and all installation requirements for construction before performing any work. The contractor shall review the existing utility and irrigation line locations with the Marriott Engineer, City and Marina Center prior to any excavation. Any change in configuration, alignment, location, or indicated dimensions of the landfill gas collection system or system components shall be approved by the Engineer and City before incorporating the change.
4. As-built conditions shall be properly recorded and documented by the Contractor as "as-built" conditions. As-built drawings shall be supplied to the Owner and Engineer at the completion of construction.

**CONSTRUCTION NOTES**

**Excavation**

5. Excavation logs shall be kept by the Contractor indicating depth of cover, depth of refuse and boring as well as a description of the "soils". The final construction of each excavation should be diagrammed. The logs shall be provided to the Owner.
6. Excavations shall not extend into undisturbed native soil nor beyond the water table. If an excavation cannot be completed to the specified depth, the Contractor shall immediately cease operations and notify the Engineer, who will determine if the excavation can be completed to the achieved depth, or if the excavation requires relocation. Excavations shall be backfilled immediately to avoid landfill gas emissions. Uncompleted excavations and condensate drain borings left open during unattended periods shall be covered with 3/4 inch CDX plywood and a 6-inch layer of soil in order to avoid surface landfill gas emissions. Barricades with appropriate warning signs shall be placed around the cover until the installation is completed. No drilling fluids shall be used during any drilling.

If an excavation into the water table can be used, it shall be backfilled with gravel up to the top level of the water table, which becomes the bottom. Abandoned excavations shall be backfilled with the refuse "cuttings," covered with soil, and wheel-rolled such that the cover of the abandoned excavation is a minimum 1 foot above the surrounding grade.

If field conditions require relocation of an excavation for a probe, well or collector from the original location, the Contractor shall contact the Engineer for instruction and approval of the new location prior to excavating at the new location.

7. Trench excavations shall be continuous, relatively smooth and free of sharp objects. Should cave-ins occur before or after installation of pipe in the trench, the Contractor shall remove and appropriately dispose of any cave-in material closer than 6 inches to any portion of the pipe. The Contractor shall maintain trench excavations free of water.
8. Trench excavations shall not be closer than 15 feet to any structure without the prior approval of the Engineer.
9. Prior to any excavation the Contractor shall contact Underground Service Alert (USA) at 800/642-2444 and the City at least 48 hours in advance.
10. Known excavated materials which contain refuse shall be disposed in a safe and reasonable manner as approved by the Local Enforcement Agency (LEA) sponsored by the California Waste Management Board (CWMB).
11. Landscaping shall be restored to meet the approval of the Engineer within 48 hours of back-filling. Paving and stripping shall be replaced to original condition within 48 hours.

**Piping**

12. Location of piping, trench well, horizontal collector and probes shall be field approved by the City and Engineer.
13. Slope is critical for the proper long-term operation of the system. A 4% minimum slope is required for all piping except the perforated portions of the trench wells and horizontal collectors. The Contractor shall use a stationary level to check the pipe slope a minimum of every 5 feet on two, three and four inch pipe and every 10 feet on six, eight and ten inch pipe. The Contractor shall document this in Field Reports which are to be submitted to the Owner or the Owner's Engineer Representative for approval the day after the recorded construction. The Contractor shall notify the Engineer for inspection prior to backfilling any piping.
14. Fusion saddles and drilling and tapping of PE pipe shall be shop fabricated unless prior approval is given by the Engineer. Only butt and socket fusion are allowed in the field. Fusion saddles must be additionally secured by stainless steel compression bands.
15. Piping interiors shall be kept clean of trash, rags, PVC and PE shavings. All abandoned piping shall be capped at all times.
16. Piping shall be "backed" in trench to minimize expansion and contraction.
17. Valve floor shall be sloped over the valve body.
18. Horizontal collectors and trench wells shall not be connected to the backfilling well. Approval has been given by the City, and the Bay Area Air Quality Management District has approved the Assembly to proceed. In the interim, a blind flange shall be installed between the horizontal collector or trench well and the valve. The excavation shall be backfilled except for what is required to access and remove the blind flange. The portion of the excavation left open shall be covered as outlined in Note 7 and the Technical Specifications.

**Condensate Drains**

19. Criteria for locating drains is as follows:
  - All low points in solid collector piping shall be connected to a condensate drain.
  - Solid collector piping shall slope at a minimum of 4%.
  - Trenching depth is to be between 2 1/2 to 5 feet in depth in paved areas and gravel parking lots, and between 1 1/2 to 5 feet in landscaped and sidewalk areas.

Condensate drain locations shown on the plan are approximate and are to be field finalized.

20. Condensate drain installation shall be done in two steps: First, the condensate drain is installed with the flex hose extending to the surface. Second, the condensate drain is connected to the pipe low point or impingement chamber by the flanged flex hose end.

**MATERIALS**

**Backfill Material**

21. All Backfill Materials must be approved by the Owner's Representative prior to their use. The Contractor shall notify and enable the Owner's Representative to sample backfill materials at least four days prior to their use.
22. Bedding material shall be select "CL" materials as defined by ASTM D2487-83 and shall be free of organics or debris and shall be 100 percent passing the No. 4 screen. Bedding material below, around, and above the pipe shall be compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557-78 method.
23. Trench Backfill shall consist of "CL" materials as defined by ASTM D2487-83 and shall be free of organics or debris and shall contain no particles larger than 2 inches in diameter. Trench backfill shall be placed in lifts of maximum 3 inches loose thickness and compacted to at least 85 percent of maximum dry density around for the top 2 feet of trench backfill, which shall be compacted to at least 90 percent of maximum dry density as determined by ASTM D1557-78 method.
24. Gravel backfill for horizontal collectors, trench extraction wells and condensate drains shall be clean, rounded, washed, and free of any organic matter. The grain size shall be not less than 3/4-inch diameter and not larger than 2 inches.

Aggregate base (AB) shall be Class 2 as designated by the Standard Specifications, State of California, Department of Transportation Section 26.102B.

Regravel shall be clean, free of any organic material, and of such size that 100 percent is retained on a U.S. Standard #4 Sieve and 100 percent passed through a U.S. Standard 1-inch.

**Pipe and Fittings**

25. Pipe and fittings unless otherwise noted, shall consist of 3408 resin high-density polyethylene (PE) rated SDR 17 and shall be joined by heat fusion methods in conformance with manufacturer's installation instructions and ASTM D2857-79 Standard Practice for Heat-Joining Polyethylene Pipe and Fittings. Polyethylene plastic pipe and insulation shall follow City of Berkeley Detail Specification No. 14. Butt fusion for 6-inch pipes shall achieve a double roll-back bead of 3/16-inch minimum width. Butt fusion for 4-inch and smaller diameter pipes shall achieve a double roll-back bead of 1/8-inch minimum width. The LFG collection system pipe, fittings, valves, and associated parts shall be installed in conformance with ASTM D2774-72 Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping. Dirt and debris shall be prevented from entering the collection system piping.
26. Pipe and fittings designated polyvinyl chloride (PVC) shall be Schedule 40 or better, conforming to ASTM Designation D2466. Two inch wyes may be drain waste vent (DWV) pipe. All perforated portions of piping are to be constructed of Schedule 40 PVC pipe. Performances shall be as per drawing detail.
27. Connections between PVC parts shall be in accordance with ASTM D2855-83 Standard Practice for Making Solvent-Cemented Joints with PVC Pipe and Fittings and shall use IPS 711 PVC cement and IPS P70 primer by Industrial Polychemical Services or approved equals in accordance with manufacturer's instructions.
28. Butterfly valves shall be wafer type, with PVC, Type 1 material valve body and disc, and with a Viton seal. Butterfly valves shall be manufactured by GFC Plastic Systems, Inc., 2882 Dow Avenue, Tustin, California 92680; (714) 731-8200, Asahi/America, 425 Riverside Avenue, Modesto, Maine 02155 (617) 391-2353 or approved equivalent.
29. Flanges for PE pipe shall be ductile iron with an epoxy coating. Flanges for PVC pipe shall be PVC Schedule 80. Flange gaskets shall be neoprene. Flange studs and nuts shall be stainless steel or have a zinc dichromate coating. Flange studs shall be grade A316 and flange nuts shall be grade A304. Flanges shall be assembled with Permatex Anti-Size or similar compound.
30. Flex hose for condensate drains shall be 1-inch PVC Flexible Pipe Size 800, #1017, as supplied by Ryan-Herco Industrial Plastics, 1819 Junction Avenue, San Jose, California 95131, (408) 434-1141, or an approved equal. Flex hose shall be installed by applying PVC primer to rigid PVC fittings only, then Flex PVC cement (Ryan-Herco No. 3450) shall be applied to both surfaces. The hose is then immediately inserted into the fitting.
31. Flux connector for well/borehole connections shall be Kamflex Corporation, Series 100 - PS PVC union hose as supplied by Prolibody Inc., 13618 So. Alton Avenue, Gardena, CA 90249, (213) 321-6636, or an approved equivalent. Hose and pipe shall be solvent cemented and then the pipe inserted a minimum of 4 inches into the flanges and secured with Kamflex Powerlock Clamps on each end.
32. Handholes in landscaped areas shall be Brooks No. 1100 or approved equivalent. Handholes shall be labeled "gas". Handholes in road, parking areas, and sidewalks shall be Christy G5 Traffic Valve Bore or approved equivalent. Approved equivalents shall be rated for H-20 loading for roads and H-10 loading for parking areas.
33. Detector tape shall be a 2-inch minimum wide warning tape color coded and imprinted with "CAUTION - Buried Gas Line Below". Detectable marker tape shall be Terra Tape "D" Detectable Tracer Tape or approved equivalent. For information on the nearest distributor of Raaf Industries detectable marker tape contact: Raaf Industries, Inc., IPSV Division, P.O. Box 33310, Houston, Texas 77233, phone (800) 231-2417.
34. Sampling ports for PE pipe shall be 1/4-inch male pipe thread by hose end. Sampling ports shall be capped into each flange on both sides of all valves. Sampling ports shall be shop fabricated.

**SAFETY PROVISIONS**

The contractor shall submit to the City for approval a construction site Safety Plan that complies with all applicable regulations under 29 Code of Federal Regulations (CFR), 1926, Construction Industry, and National Institute for Occupational Safety and Health (NIOSH) publication No. 85-115. The Contractor shall be fully responsible and liable for adhering to the approved Safety Plan at all times during construction.



SUBMITTED: Michael J. Lottin Jr. SENIOR CIVIL ENGINEER	DATE: 8/17/88 R.C.E. 8/23/88 D.P. 8/18/88	RECOMMEND APPROVAL: [Signature] ASSISTANT CITY ENGINEER	DATE: 8/18/88 R.C.E. 8/23/88 D.P. 8/18/88	DESIGN: _____	HORIZ: _____	CITY OF BERKELEY DEPARTMENT OF PUBLIC WORKS	SOUTH OF SPINNAKER WAY BERKELEY LANDFILL Gas Testing & Monitoring System	JOB NO.: 2106,024.02	DRAWING NO.: C2	REV.: 1
APPROVED:	DATE: _____	DATE: _____	DRAWN: _____	VERT: _____						
AS BUILT:	DATE: _____	DATE: _____	CHECK: _____	BOOK: _____						
	DATE: _____	DATE: _____	AS BUILT: _____	DATE: _____						

**Harding Lawson Associates**  
Engineers and Geoscientists  
P.O. Box 578  
Novato, California  
(415) 892-0821

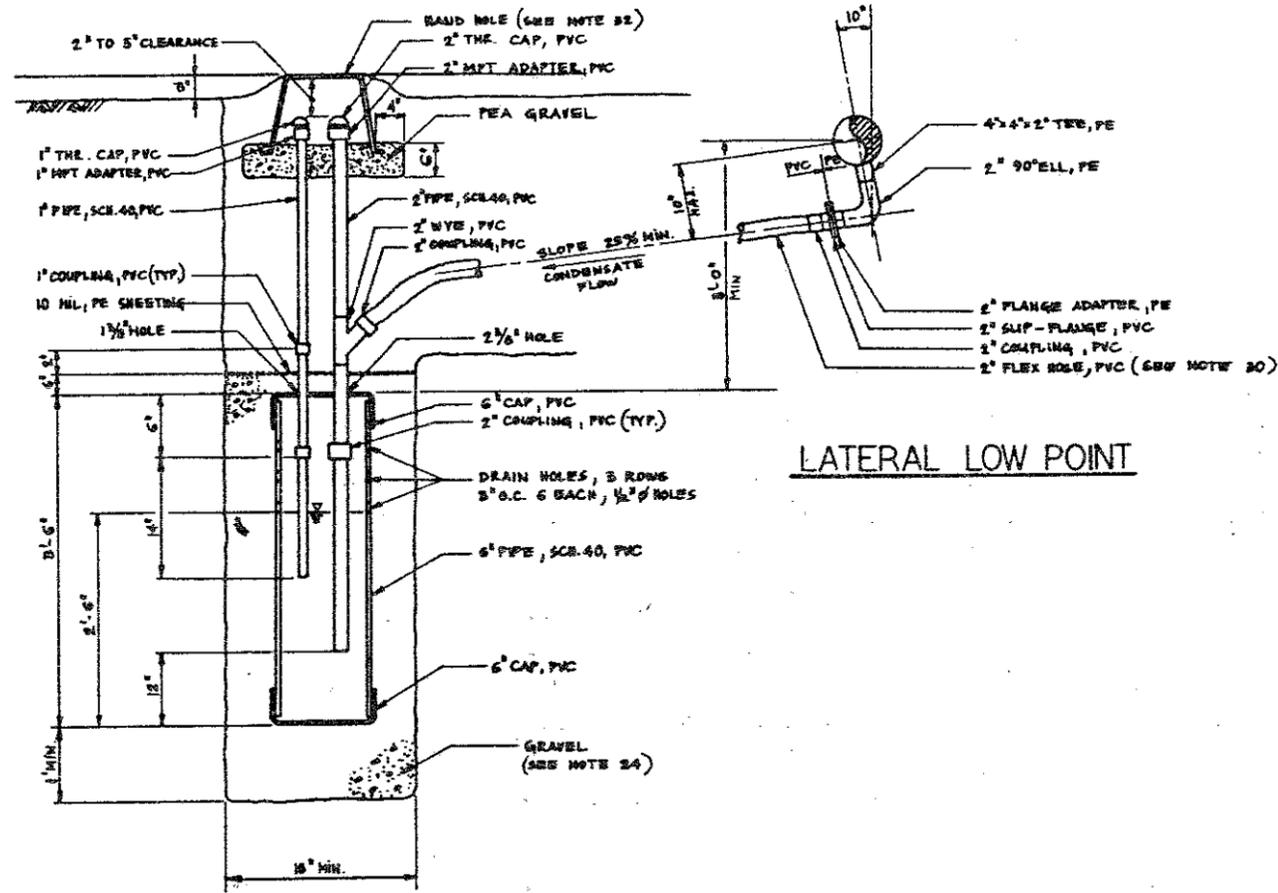
**CITY OF BERKELEY**  
DEPARTMENT OF PUBLIC WORK  
3001 ADRIAN ST. BERKELEY, CA 94704

**NOTES**  
LANDFILL GAS COLLECTION SYSTEM  
SOUTH OF SPINNAKER

SCALE: NTS  
DESIGNED BY: K.E. EICHSTAEDT  
DRAWN BY: A. KATANICS  
CHECKED BY: S. ALMAHLA  
DATE: 8/18/88  
APPROVED BY: [Signature]

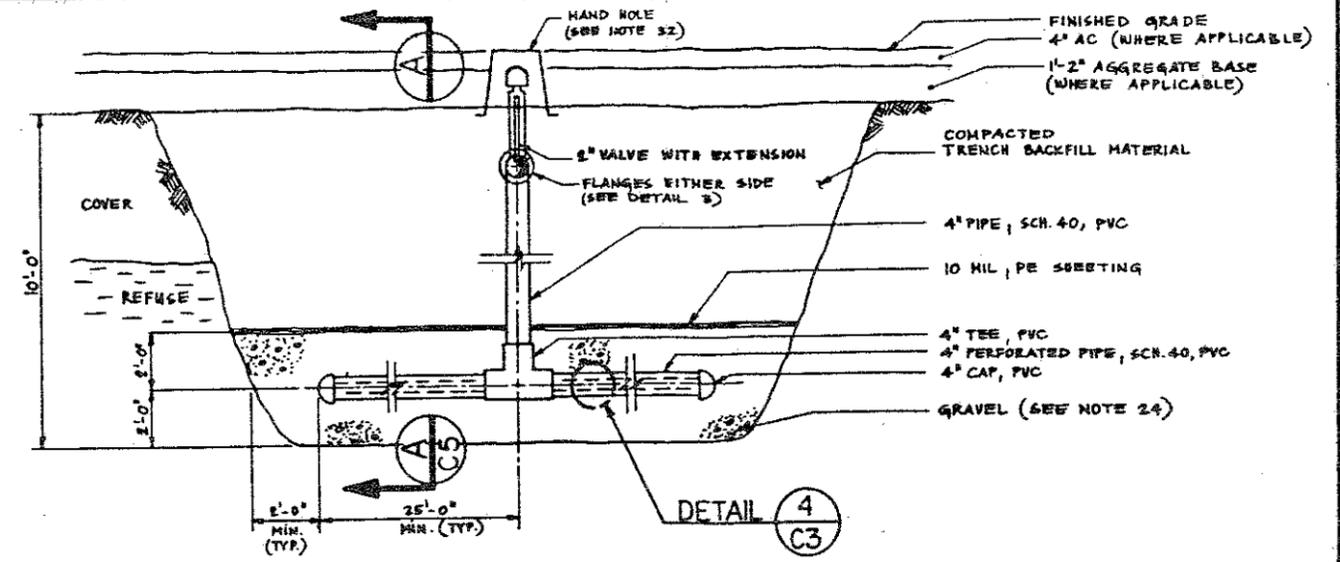
3/5/88 RECORD DRAWING  
12/18/87 ISSUED FOR CONSTRUCTION



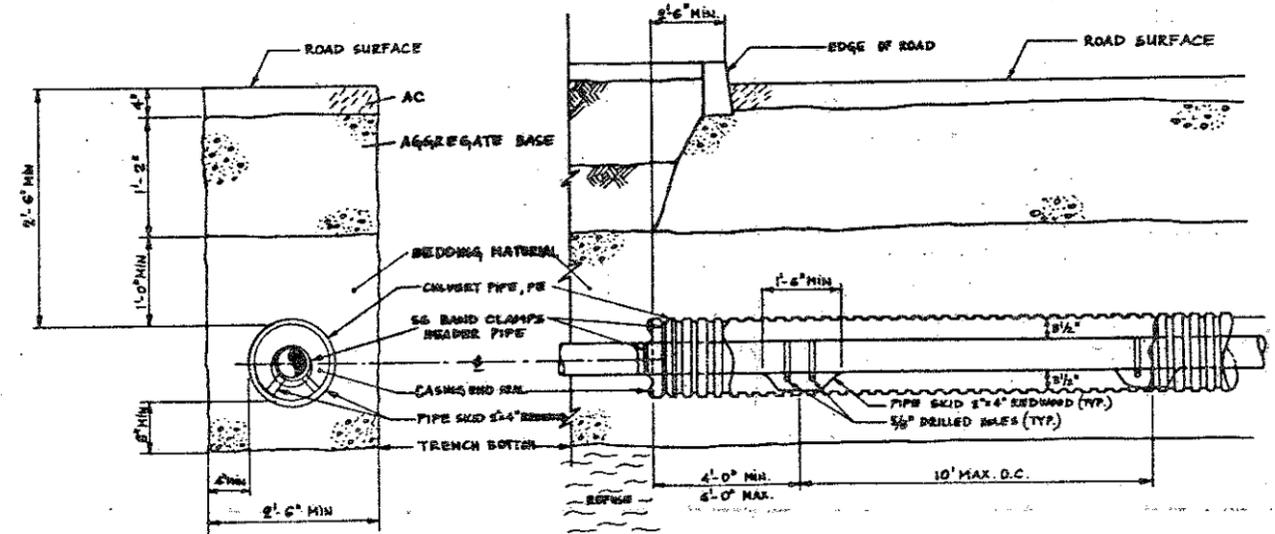


CONDENSATE DRAIN

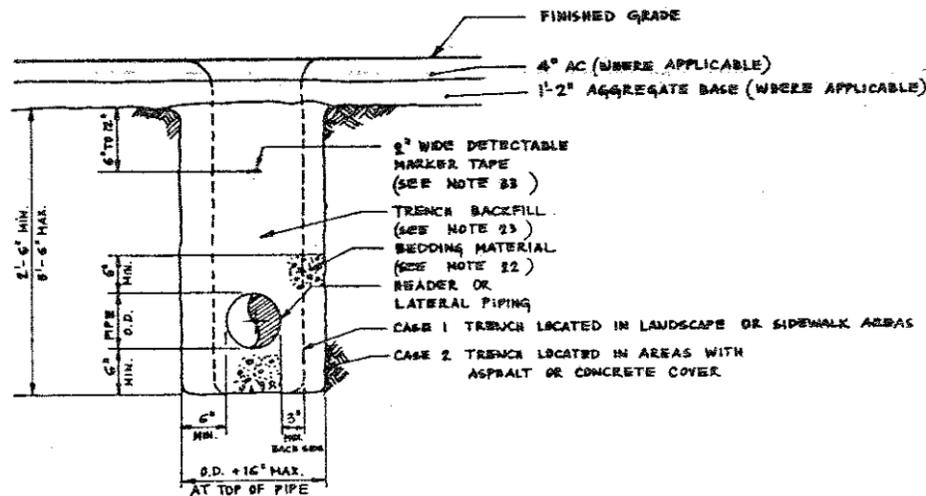
LATERAL LOW POINT



TRENCH WELL



ROAD CROSSING



TYPICAL TRENCH CROSS SECTION



DESIGNED BY: <i>Robert S. Lott Jr.</i>	DATE: <i>8/12/88</i>	RECORDED APPROVAL: <i>[Signature]</i>	DATE: <i>8/12/88</i>	DESIGN: _____	HORIZ: _____	CITY OF BERKELEY DEPARTMENT OF PUBLIC WORKS	SOUTH OF SPINNAKER WAY BERKELEY LANDFILL Gas Testing & Monitoring System	JOB NO.: 2106,024.02	DRAWING NO.: C4	REV.: 1
DRAWN BY: _____	DATE: _____	ASST. CITY ENG. FOR PUBLIC WORKS	DATE: _____	DRAWN: _____	VERT: _____					
CHECKED BY: _____	DATE: _____		DATE: _____	CHECK: _____	BOOK: _____					
AS BUILT: _____	DATE: _____		DATE: _____	AS BUILT: _____	DATE: _____					

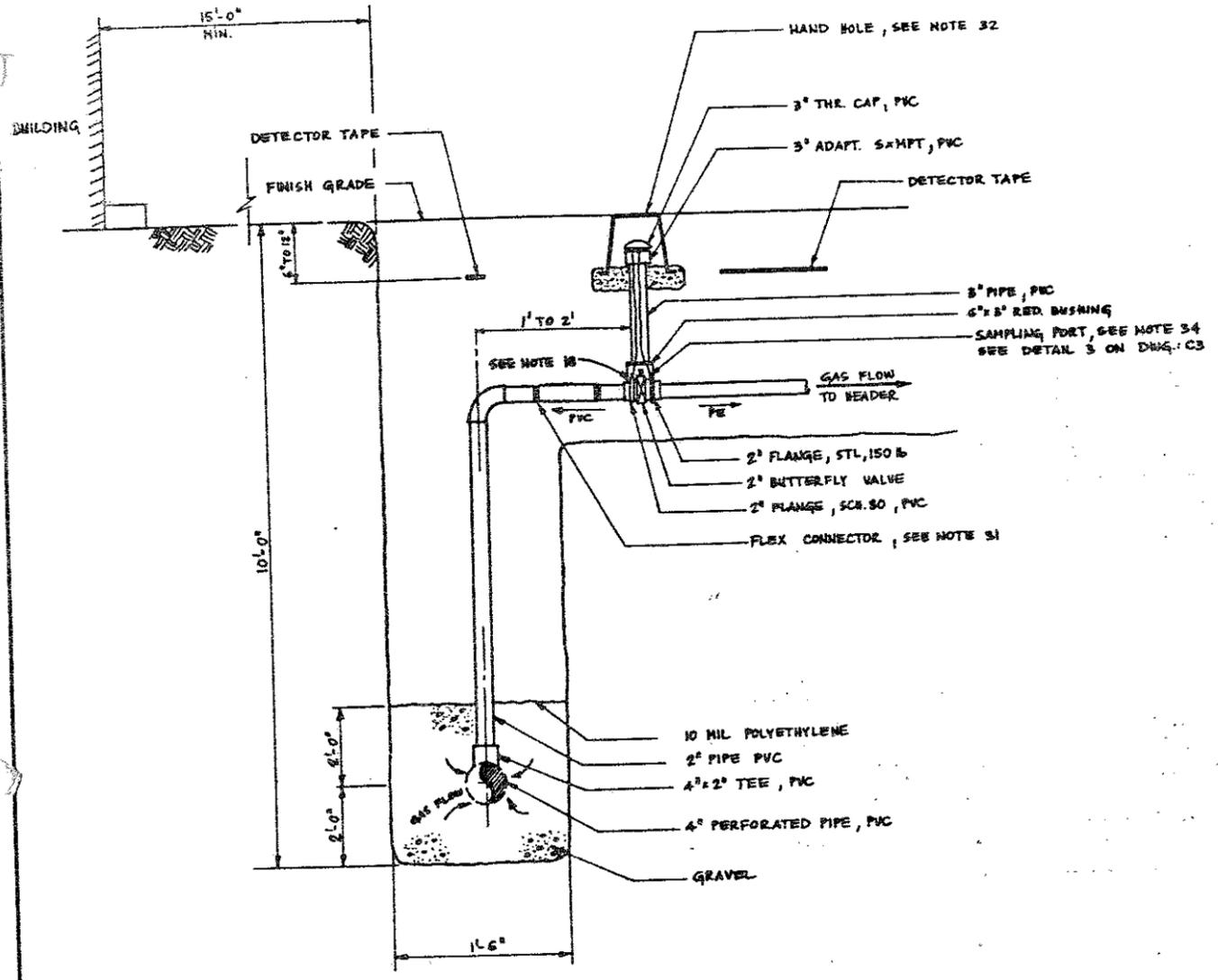
SCALE: HTS	DESIGNED BY: K.E. EICHSTAEDT <i>KEE</i>
DESIGNED BY: A. KATAMIS <i>AK</i>	DRAWN BY: _____
CHECKED BY: <i>Robert S. Lott Jr.</i>	DATE: <i>8/18/88</i>
DATE: _____	APPROVED BY: _____

**Harding Lawson Associates**  
Engineers and Geoscientists  
P.O. Box 578  
Novato, California  
415/897-7871

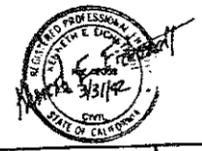
CITY OF BERKELEY  
DEPARTMENT OF PUBLIC WORKS  
3001 ARDEN ST. BERKELEY, CA 94704

DETAILS  
LANDFILL GAS COLLECTION SYSTEM  
SOUTH OF SPINNAKER WAY

RECORD DRAWING  
ISSUED FOR CONSTRUCTION



TRENCH WELL  
SECTION (A-A)  
C4



SUBMITTED: <i>Keith J. Little Jr.</i> SENIOR CIVIL ENGINEER	DATE: 8/23/87 R.C.E. 10/25 EXP. 5/20/88	RECOMMENDING APPROVAL: <i>[Signature]</i> ASSISTANT CITY ENGINEER	DATE: 8/23/87 R.C.E. 10/25 EXP. 5/20/88	DESIGN: _____ DRAWN: _____ CHECK: _____ AS BUILT: _____	HORIZ. _____ VERT. _____ DATE: _____	CITY OF BERKELEY DEPARTMENT OF PUBLIC WORKS	SOUTH OF SPINNAKER WAY BERKELEY LANDFILL Gas Testing & Monitoring System	PLAN 6927 FILE 906-74 SHEET 6 OF 6
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3/15/87 RECORD DRAWING 10/18/87 ISSUED FOR CONSTRUCTION	SCALE: NTS DESIGNED BY: K.E. EICHSTAEDT DRAWN BY: A. KATAMCS CHECKED BY: S. ALMAHLA DATE: 8/18/87 APPROVED BY:
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 Engineers and Geoscientists  
 P.O. Box 578  
 Novato, California  
 (415) 892-0821

CITY OF BERKELEY  
 DEPARTMENT OF PUBLIC WORKS  
 1001 ADKINSON ST. BERKELEY, CA 94704

DETAILS  
 LANDFILL GAS COLLECTION SYSTEM  
 SOUTH OF SPINNAKER

JOB NO.: 2106,024.02  
 DRAWING NO.: C5  
 REV.: 1