4254

CAMBRIA

May 14, 2001

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

MAY 17 2001

Re: **Agency Response**
Former Shell Service Station
461 8th Street
Oakland, California
Incident #97093399
Cambria Project #243-1501

Dear Mr. Chan:

On behalf of Equiva Services LLC, Cambria Environmental Technology, Inc. (Cambria) is submitting this correspondence addressing elevated hydrocarbon concentrations in wells S-5 and S-6 at the above-referenced facility. This correspondence is made in response to an April 11, 2001 Alameda County Health Care Services Agency (ACHCSA) letter.

SITE SUMMARY

Site Description: The site is currently a paved parking lot located at the southwest corner of the intersection of 8th Street and Broadway in Oakland, California (see Figure 1). The property was leased by American Oil Company from at least 1965 until 1972 when the lease was assigned to Shell Oil Products Company (Shell) (now Equiva Services LLC). A Shell service station operated on the property from 1972 to 1980. The underground storage tanks (USTs) associated with the former Shell service station were removed after Shell terminated operations at the site in May 1980.

Site History: In January 1979, separate phase hydrocarbons (SPH) were reported in a Bay Area Rapid Transit (BART) tunnel under the intersection of 7th Street and Broadway. Product line testing at the site indicated a pressure leak, and the product lines were replaced in January 1979. The USTs were also tested for tightness and passed. According to the *Bart Recovery Project Log* (chronological list of events – 1/10/97 through 12/3/81) (Attachment A) and a 1981 Groundwater Technology, Inc. *Considerations on Infiltration of Gasoline into BART KE Line* report, one observation well is reported to have been drilled to a depth of 25 feet concurrent with piping replacement with no reports of contamination. Product samples taken from the BART tube in

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

January 1979 and in May 1981 indicated Shell Regular product. Approximately 2,600 gallons (48 55-gallon drums) of a gasoline-and-water mixture are reported to have been removed from the BART tunnel between October 1979 and April 1980. The Shell station discontinued operation in May 1980, and all existing improvements, tanks and associated piping were removed at that time. It is unknown whether a UST and piping removal report exists.

Seven monitoring wells, L-1 through L-7, were installed in 1981. Based on recommendations following this investigation, a recovery well was installed in the vicinity of well L-6 (now renamed S-6) in 1982. According to a September 14, 1993 GeoStrategies Inc. (GSI) *Work Plan*, groundwater extraction from the recovery well began in February 1982 and continued until August 1982, when the system was shut down because the effluent discharge exceeded permitted discharge levels.

Wells L-1 through L-3 were destroyed during construction in the mid 80's and are no longer accessible. Records of the well destructions are not available. Wells L-4, L-5 and L-6 were renamed S-4, S-5 and S-6. Gettler-Ryan Inc. began gauging wells S-4 through S-6 in 1986 and collecting groundwater samples for analysis in 1988. A November 2, 1993 *Work Plan for Soil and Groundwater Sampling* prepared by Enviros, Inc. (Enviros) indicates that groundwater was extracted from wells S-5 and S-6 by bailing or by a vacuum truck beginning in October 1988.

Information collected by GSI and reported in a June 30, 1993 *Phase I Preliminary Site Assessment* identified seven sites within a ¼-mile radius of the site with known UST leaks. One of the seven sites identified is the Oakland Police Department site, which was noted in the *Bart Recovery Project Log* (Attachment A) to have replaced leaking USTs in October 1979 and to have accepted product deliveries by a local Shell gasoline distributor. During a review of available regulatory files, GSI noted a permit to repair the product lines and dispensers at the Oakland Police Department parking lot taken out in 1984 by Egan and Paradiso Company, but no additional information was available. It appears that no environmental investigation has been conducted for this site.

In July 1994, nine soil borings were installed in the vicinity of the former pump islands and the former USTs at the site. Investigation activities are described in an August 16, 1995 Enviros *Site Investigation* Report. The maximum total petroleum hydrocarbons as gasoline (TPHg) and benzene concentrations reported in soil samples were 15 parts per million (ppm) and 0.24 ppm, respectively, collected near the former pump islands. No TPHg or benzene was reported in the area of the former piping or the former UST locations.

In December 1994, onsite monitoring wells S-8, S-9 and S-10 were installed. Investigation activities are described in a February 14, 1995 Enviros *Site Investigation Report and Quarterly Monitoring Report – First Quarter 1995*. Except for 0.014 ppm benzene in sample S-8-21.5, no TPHg or benzene were reported in soil samples collected from wells S-8 and S-9. Except for 760 ppm TPHg and 0.0032 benzene reported in sample S-10-11.5, no TPHg or benzene were reported in soil samples collected from well S-10.

Groundwater Monitoring: Historical groundwater monitoring data indicates that onsite monitoring wells S-8, S-9 and S-10 have reported TPHg concentrations ranging from below method detection limits to 4,800 parts per billion (ppb) and benzene concentrations ranging from 1.0 ppb to 1,800 ppb. No SPH have been reported onsite. Offsite well S-5 has consistently reported SPH, and wells S-5 and S-6 have reported up to 142,000 ppb TPHg and 29,000 ppb benzene. Currently, groundwater is extracted from wells S-5 and S-6 during quarterly monitoring activities to facilitate SPH removal.

DISCUSSION

Shell was proactive in addressing SPH when they were initially discovered in the BART tube in 1979. Investigation was performed, a recovery system installed, and ongoing monitoring has taken place over an extended period of time. In the late 70's and early 80's at the time of these activities, neither Shell nor government agencies had UST programs in place to deal with these situations nor were the techniques to investigate them as refined as they are today. As such, Shell responded to what was an emergency situation without fully evaluating the extent of its responsibility, despite the fact that no leak was identified when the USTs were tested.

SPH have never been identified on the former Shell site. Laws of chemical fate and transport dictate that SPH will never be identified at higher levels at any point downgradient of their source area. Well S-10 is installed within the former USTs areas, and well S-9 is downgradient of former pump island areas. No SPH have been found in these wells, and dissolved concentrations are significantly lower than found in downgradient wells S-5 and S-6. This situation would conflict with laws of fate and transport if the hydrocarbons originated from the site.

Other potential offsite sources were identified in both the June 30, 1993 GSI Phase I Preliminary Site Assessment and in an August 12, 1996 *Offsite Source Investigation* prepared by Enviros. The most likely of these sources are the former Chevron located on 5th and Broadway and the Oakland Police Department (see Figure 1). ACHSA has dismissed these potential sources as being located downgradient of identified SPH. However, it is unknown what gradient

fluctuations have occurred over time. During construction of the BART line in the late 70's and early 80's, it is likely that extensive dewatering was done, resulting in many gradient fluctuations. The attached letter, sent to Shell by BART management, indicates that the gasoline intrusion that initiated this investigation was in fact located at "Engineering Station 915+64" (Attachment B). The attached BART plan and profile shows this location to be at approximately 7th Street and Broadway, directly in front of the previously identified former Chevron. In contrast, the former Shell is located near Engineering Station 918, over 200 feet away.

RECOMMENDATIONS

In light of information previously presented and reiterated in this document, we continue to believe that the former Shell station is not the likely source of the SPH. We reiterate our request that other potential sources in this area be investigated.

In response to the ACHCSA correspondence dated April 11, 2001 and based on the data from previous site assessments and the available quarterly monitoring data, we recommend the course of action:

- Cambria will perform a field search to identify utility conduit trenches as well as to review all available utility maps for locations and approximate depths of any existing utility trenches adjacent to the site.
- A receptor survey will be performed to identify any potential sensitive receptors in the vicinity of the site. Cambria will also perform a survey to identify any existing wells within a ½-mile radius of the site. This will be performed by searching existing well records kept by the California Department of Water Resources (DWR) and Alameda County as well as a field search of the local vicinity.
- Cross-sectional diagrams will be prepared using available boring logs and utility information from the conduit study for the site.

The conduit study and cross-sections will allow us to evaluate whether unique preferential pathways exist which would allow migration of SPH from the former Shell station to well S-5, despite the absence of SPH onsite. Upon approval of Cambria's recommendations by the ACHCSA, we will proceed with the activities described above.

CLOSING

We appreciate the opportunity to work with you on this project. Please call Jacquelyn Jones at (510) 420-3316 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc

Jacquelyn L. Jones
Project Geologist

Diane M. Lundquist, P.E.
Principal Engineer

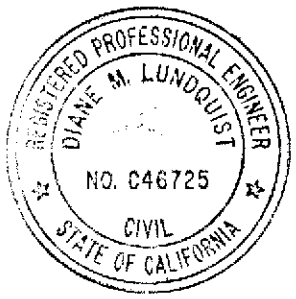

Figure 1 – Site Map

Attachments: A - *BART Recovery Project Log* (Chronological list of events - 1/10/97 through 12/3/81)
B - July 7, 1981 BART letter and BART Plan and Profile

cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, California 91510-7869
Rory Campbell, Hanson, Bridgett, Marcus, Vlahos, & Rudy, 333 Market Street, Suite 2300, San Francisco, California 94105-2173
Wells Fargo Bank National Association, Tr. (Property Owners), c/o Pacific Property, 364 Bush Street, San Francisco, CA 94104-2805
R. Casteel & Co., P.O. Box 6839, Moraga, California 94570

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05/11/01

Site Map

EXPLANATION

S-4 ● Monitoring well location

NINTH STREET

Former Blue and White Cab Co.
807 Broadway

Former Phillips 66 Station

Former Richfield Station
800 Franklin

8th Street Garage
362 8th

EIGHTH STREET

approximate UST location

S-10

S-8

Former Shell Service Station
461 Eighth Street

approximate dispenser island and fuel line locations

S-9

S-4

Former True B Service
713 Franklin

S-5

SEVENTH SRTEET

WASHINGTON STREET

Former Service Station
625 Washington

S-6

City of Oakland Hall of Justice
Police Administration Building
455 Seventh Street

BROADWAY

Former Chevron
636 Broadway

Former Flying A Service
629 Franklin

FRANKLIN STREET

approximate UST Location - Oakland Police Motorpool

INTERSTATE 880

N

0 50 100
Scale (ft)

FIGURE
1

Former Shell Service Station
461 Eighth Street
Oakland, California
Incident #97093399

CAMBRIA

G:\OAKLAND\461EIGHTH\FIGURES\SITEMAP.DWG

ATTACHMENT A

BART Recovery Project Log
(Chronological list of events – 1/10/97 through 12/3/81)

SHELL OIL CO.
EAST BAY DISTRICT

BART RECOVERY PROJECT LOG

This is a report in chronological order of all events and action taken regarding gasoline leakage into BART tube section near 7th St./Broadway, Oakland, California - 1979.

JANUARY 10, 1979

Shell dealer notified District Engineer that local fire inspector received a report from BART that gasoline was leaking into tube area.

District Engineer notified H. O. Engineering Dept., T. Maher.

JANUARY 11, 1979

District Engineer ordered a test on Super Shell, Super Regular (unleaded) and Shell Regular product lines - test failed. All systems shut down to eliminate additional loss of gasoline. Fire inspector requested a Kent-Moore test to be performed on all underground storage tanks.

JANUARY 19, 1979

Sample product taken from BART tube forwarded to Westhollow Lab for analysis. Results: Shell Regular product (leaded) 2-23-79.

JANUARY 22, 1979

All underground storage tanks tested with Kent-Moore tank tightness tester - results indicate all tanks tested satisfactory.

JANUARY 26, 1979

Installation of new fiberglass product and vapor lines to replace 16 year old galvanized steel lines. In addition, one observation well installed at low gradient area of property with negative reports.

FEBRUARY 1979 THROUGH DECEMBER 1979

Open for business.

MAY 19, 1979

District approved gratis delivery for 1,851 gallons.

SEPTEMBER 5, 1979

Issued contract to Industrial Tank Lines to pump out 28 drums of gasoline/ water mixture in BART tube.

OCTOBER, 1979

City of Oakland Police Department removed and replaced leaking underground storage tanks, product deliveries by local Shell distributor.

OCTOBER 5, 1979

Industrial Tank Lines removed gasoline and water mixture from 20 - 55 gallon drums in BART tube.

JANUARY 1980 THROUGH APRIL 1980

Service station open for business and selling all products.

APRIL 2, 1980

Industrial Tank Lines removed gasoline water mixture from 28 - 55 gallon drums in BART tube.

MAY 1980

District terminated leasehold agreement and removed all existing improvements, building and all underground storage tanks.

1981

MAY 1981

BART submitted a copy of proposal prepared by Crowley Environmental Services Corp. for recovery research.

MAY 14, 1981

District contracted with Crowley Environmental Services Corp. to perform investigative research and recovery study.

MAY 19, 1981

Issued contract to Groundwater Technology to conduct preliminary investigation to determine extent of contamination and obtain necessary permits for drilling on private and public properties.

MAY 13, 1981

Sample of product taken from BART tube forwarded to Westhollow Lab for analysis. Results: Weathered gasoline or kerosene.

MAY 28, 1981

Sample of product taken from BART tube forwarded to Westhollow Lab for analysis. Results: Identified as [illegible] regular.

JUNE 1981

Groundwater Technology working on obtaining necessary approvals and permits to install 7 observation wells on public and private properties.

JULY 5, 1981

Issued a contract to Cowhey Pacific Drilling Co. (subcontractor for Groundwater Technology) to perform services previously contracted to Groundwater Technology.

BART'S insurance carrier required $10,000,000 liability coverage; Groundwater Technology unable to meet insurance requirements.

AUGUST 10, 1981

Groundwater Technology submitted plans to BART for approval on 7 well locations.

AUGUST 26, 1981

BART submitted a letter of approval to Shell for observation well locations.

AUGUST 25, 26, 27 & 31

Cowhey Pacific Drilling Company installed the following observation wells: #1, 2, 3, 4.

SEPTEMBER 2, 3, 8 & 10

Cowhey Pacific Drilling Company installed the following observation wells: #5, 6 & 7.

OCTOBER 19, 1981

Groundwater Technology submitted a preliminary report on observation wells technical geological data.

NOVEMBER 5, 1981

District Engineer received completed study prepared by Groundwater Technology and forwarded copy to Head Office Environmental Engineering, C. Stanley, for reviewing and designing a recovery system.

NOVEMBER 9 - 18, 1981

District Engineer on vacation.

NOVEMBER 19, 1981

BART informed District Engineer the newly completed KE line (tube) is scheduled to receive trains on December 15, 1981.

District notified Head Office Environmental Engineer, C. Stanley, immediately.

NOVEMBER 20, 1981

Advised by C. Stanley via telecon to check with city regarding permit requirements and to install recovery well in the vicinity of observation well #6.

NOVEMBER 23, 1981

Contacted Cowhey Pacific Drilling Company and met on Broadway/7th to verify proposed site for recovery well near casing #6.

NOVEMBER 30, 1981

C. Stanley advised District to obtain Fire Marshall's assistance if problem develops with City of Oakland regarding permits.

DECEMBER 1, 1981

A preliminary meeting with BART, Fire Marshall and City of Oakland resulted in a verbal temporary approval to install recovery system underground on city property. Final approvals will be issued after receipt and review of all plans.

DECEMBER 3, 1981

Special meeting with the above parties and Head Office personnel for further discussion.

ATTACHMENT B

July 7, 1981 BART letter and BART Plan and Profile

BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street
Oakland, California 94607
Telephone (415) 465-4100

November 25, 1981

Mr. Raymond G. Newsome, District Engineer
Shell Oil Company
2401 Crow Canyon Road
P.O. Box 250
San Ramon, California 94583

Subject: BART KE Track - Gas Leak
7th & Broadway, Oakland

Dear Mr. Newsome:

This letter is to advise you that the first phase of the KE Track construction is now completed and we would very much like to put this new facility into service on December 15, 1981. It is important we meet this target date as this new facility will greatly enhance our revenue operation capabilities.

As you are aware, we have had serious gas intrusion problems in our subway at Engineering Station 915 + 64 since January, 1979. Your company took action to eliminate this problem by drilling seven test holes during the period of August 25, 1981 to September 10, 1981. During this period, the gas intrusion subsided. With the recent rains, however, gas intrusion has once again been noted in the vicinity of Engineering Station 915 + 64.

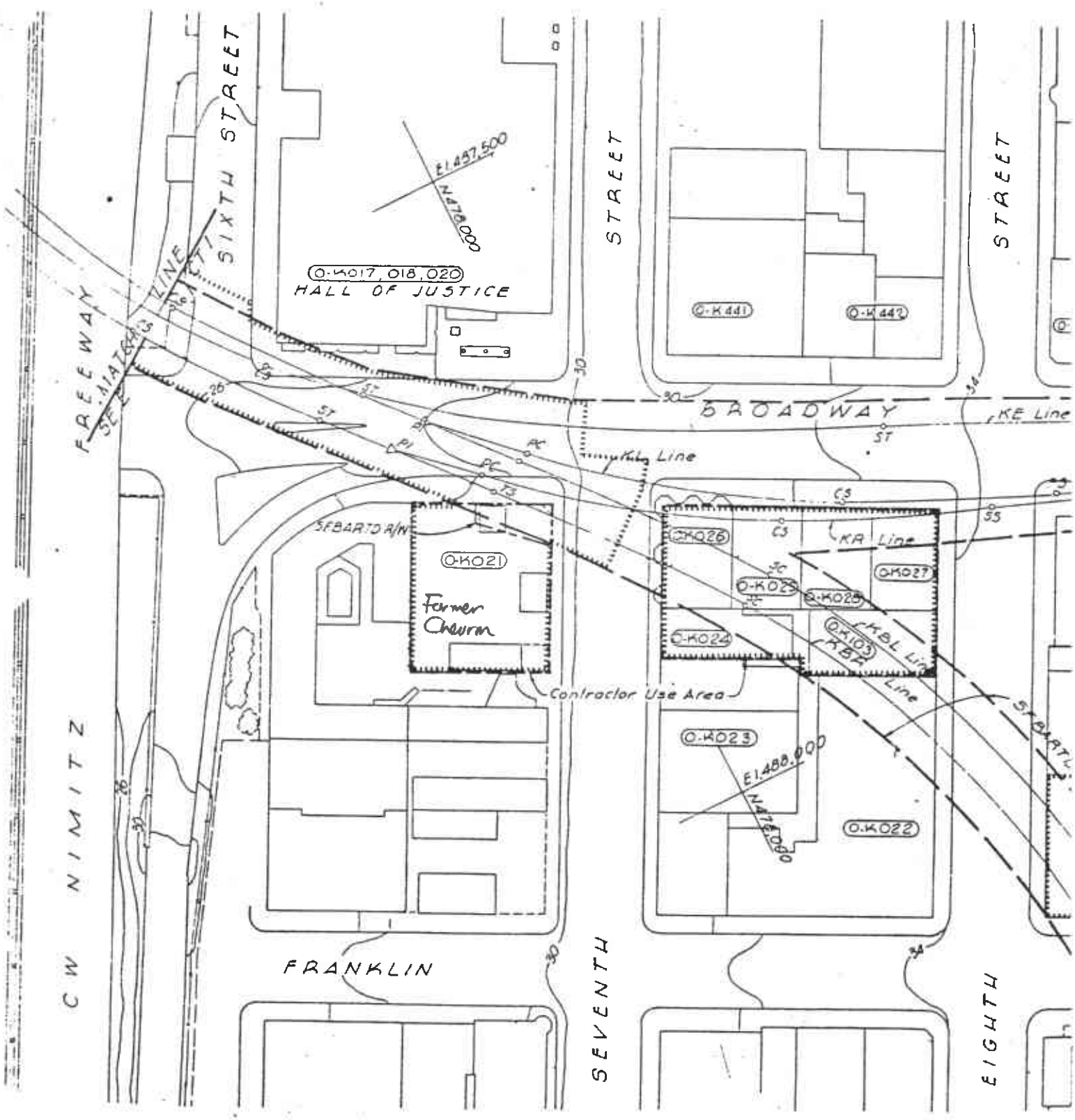
We have now reached a point in time where this condition will hamper our revenue operation due to the safety factor involved. I was under the impression the reason test holes were drilled was to give you a location where the gas could be pumped up from the water table eliminating the problem.

I appreciate the cooperation you have given us in the past and I am certain you will handle the problems we are now confronted with in the same manner.

If you have any questions regarding this matter, please feel free to contact me.

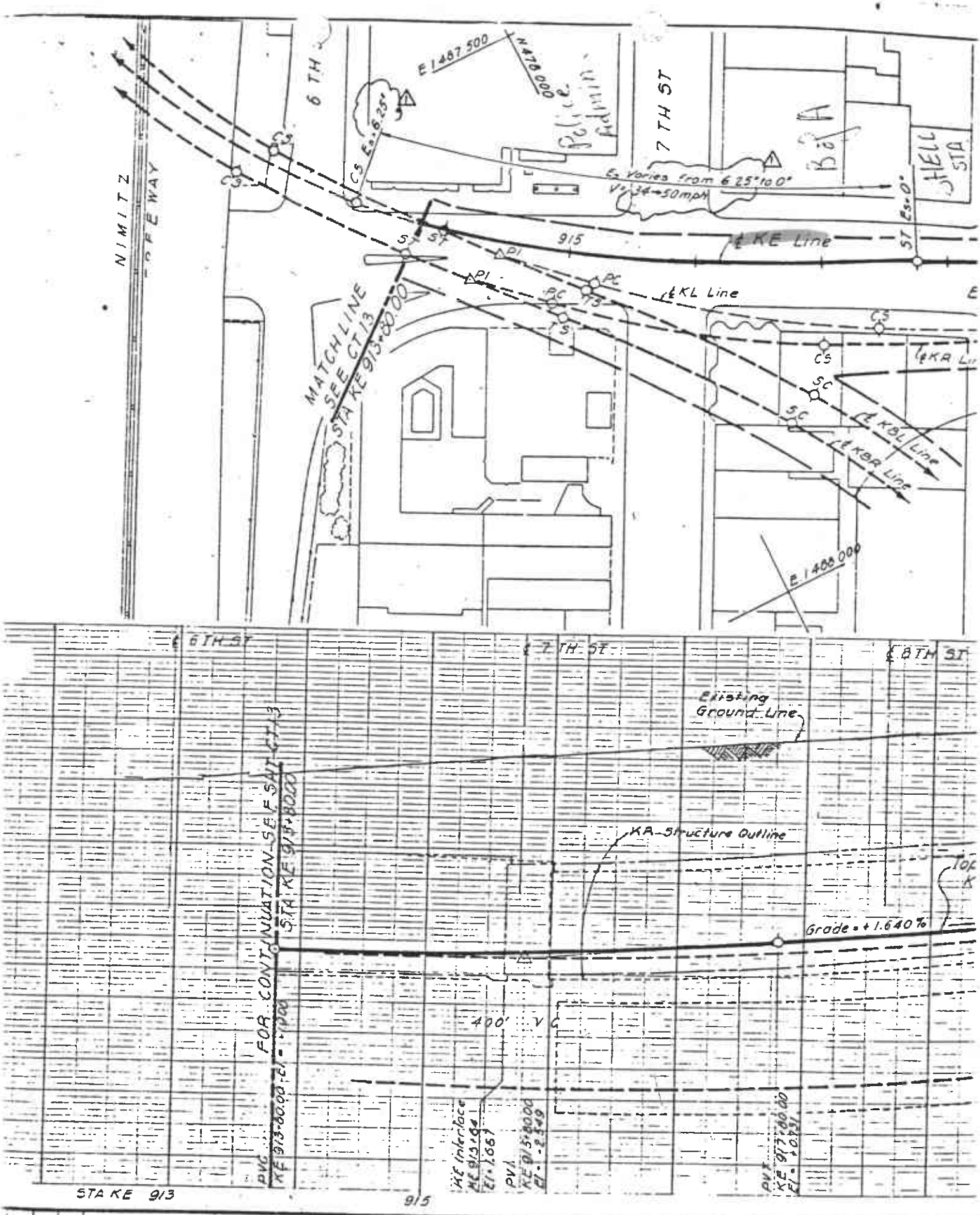
Very truly yours,

V. P. Mahon, Department Manager
Power & Way Maintenance



DESIGNED BY	A. ULRICH
DRAWN BY	A. ULRICH
CHECKED BY	J. EVERS JR.
BY CHANGE	J. BIRAMYEA

REGISTERED CIVIL ENGINEER
L. GEORGE THOR
NO. 8197
STATE OF

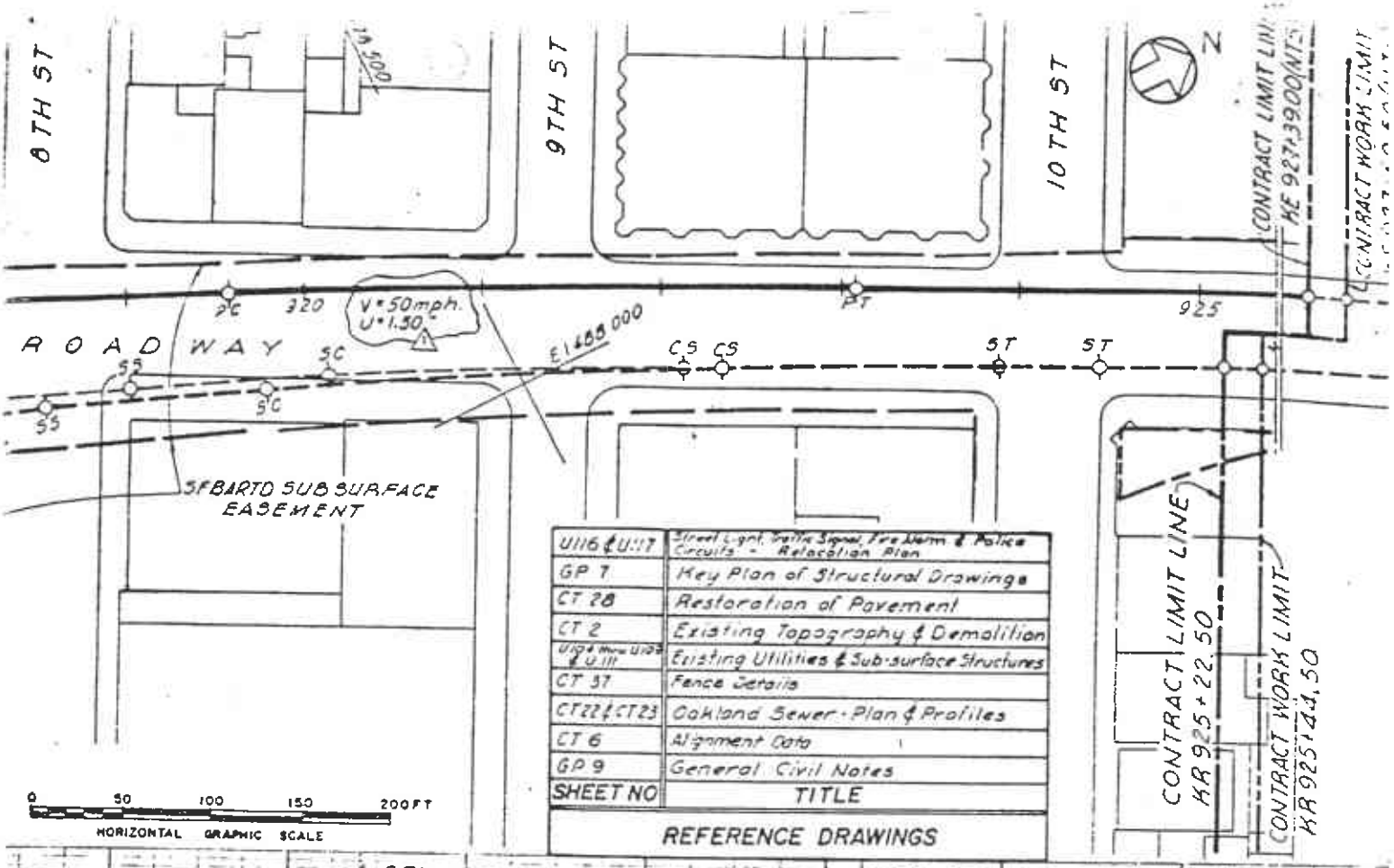


Rev. Superelev Added "V" & "v" Values

HALF SCALE

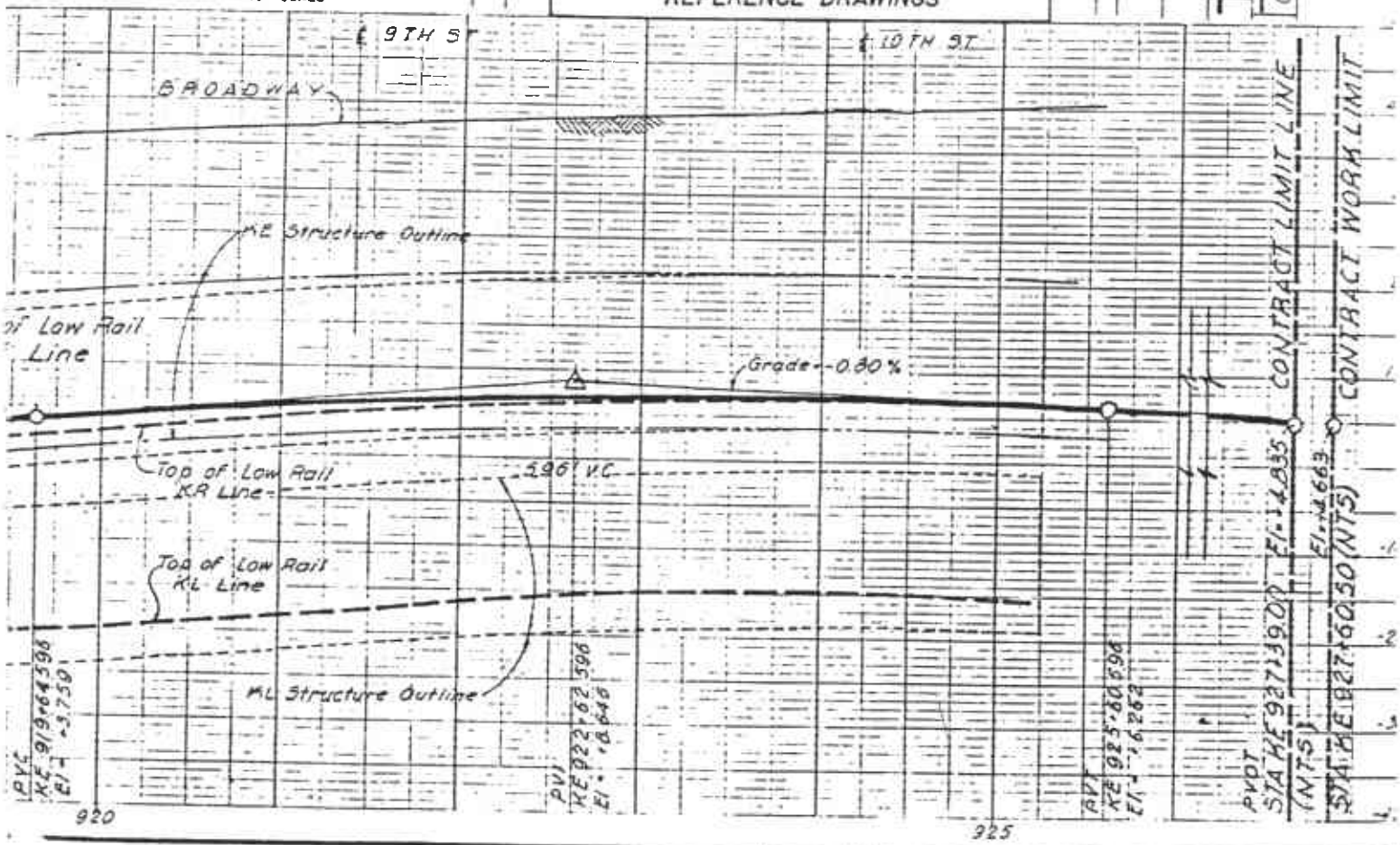
D. FITZ PATRICK
F. GLASMACHER
C. EYERS, JR.

REGISTERED CIVIL ENGINEER
J. GEORGE THOR
NO. 8392



SHEET NO	TITLE
U116 & U117	Street Light, Traffic Signal, Fire Alarm & Police Circuits - Relocation Plan
GP 7	Key Plan of Structural Drawings
CT 28	Restoration of Pavement
CT 2	Existing Topography & Demolition
U109 & more U108 & U111	Existing Utilities & Sub-surface Structures
CT 37	Fence Details
CT22 & CT23	Oakland Sewer - Plan & Profiles
CT 6	Alignment Data
GP 9	General Civil Notes

REFERENCE DRAWINGS



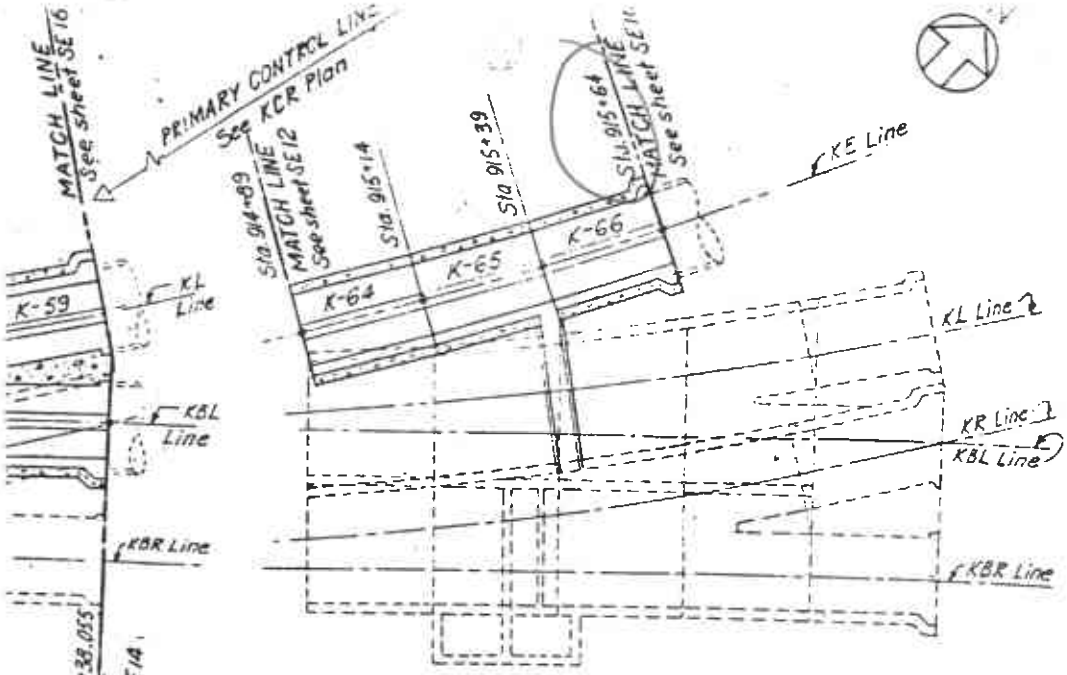
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BECHTEL CORPORATION
ENGINEERS
SAN FRANCISCO

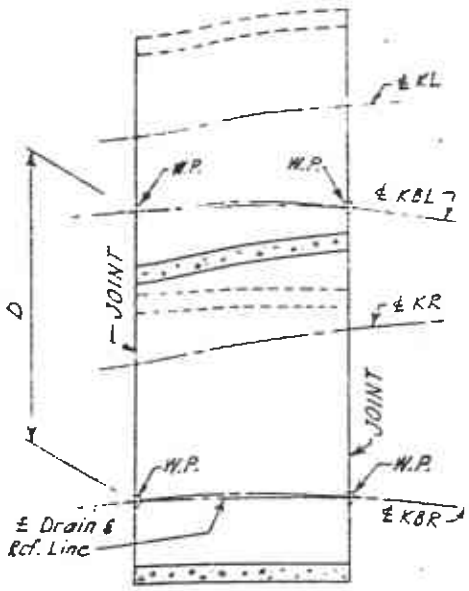
PARSONS BRINCKERHOFF-TUDOR-BECHTEL
GENERAL ENGINEERING CONSULTANTS

OAKLAND DOWNTOWN
KE LINE PLAN & PROFILE
KE 913+80 TO 927+39

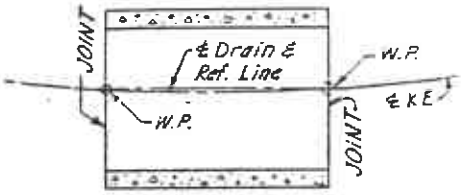
SCALE HORIZ.	1" = 50'
VERT.	1" = 10'
CONTRACT - NUMBER	IK0061-K006
SHEET NO.	CT14-1
TOTAL SHEETS	27



PLAN KE LINE
(KE Stationing)

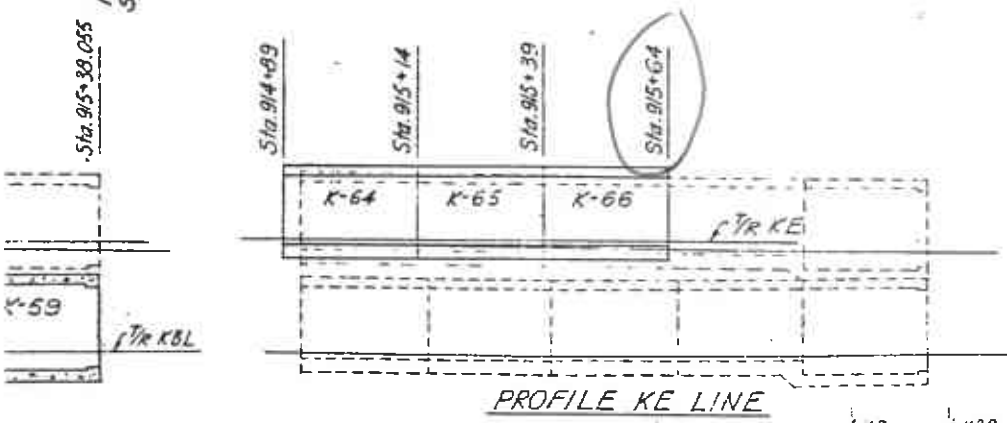


TYPICAL FOR K-55 THROUGH K-59



TYPICAL FOR K-64 THROUGH K-66

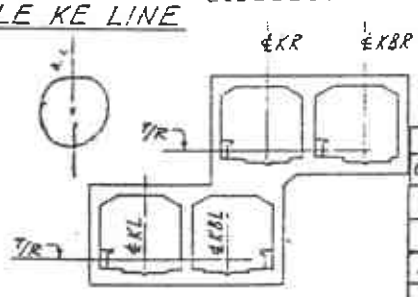
SEGMENT LAYOUT PLANS



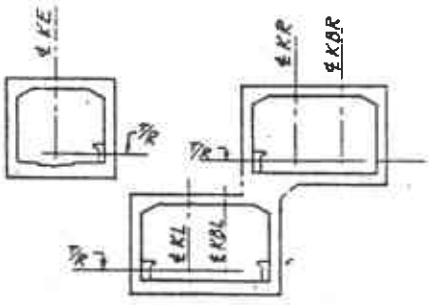
PROFILE KE LINE

NOTES :

1. Reference line is the chord between working points.



TYPICAL CROSS SECTION
SEGMENTS K-58 & K-59



TYPICAL CROSS SECTION
SEGMENTS K-55 THROUGH K-57
SEGMENTS K-64 THROUGH K-66

REFERENCE DRAWINGS

SHEET NO.	TITLE
SE 16	Structural Alignment
CT-10,12,A,5,8	Plan & Profile
SE 67-69	Conc. Outlines Segments K58 & K59
SE-161	General Struct. Notes, Symbols & Abbreviations
SE 54-58	Conc. Outlines Segments K56 & K57
SE-48	Conc. Outlines, Segments K60 Thru K65
SE-49	Conc. Outlines Segments K 52 through K55
SE-14	Structural Alignment
SE-12	Structural Alignment
SE-445	Structural Key Plan & Profile
SE-1	General Arrangement Plan
CT-7	Alignment Data
CT-6	Alignment Data

N FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

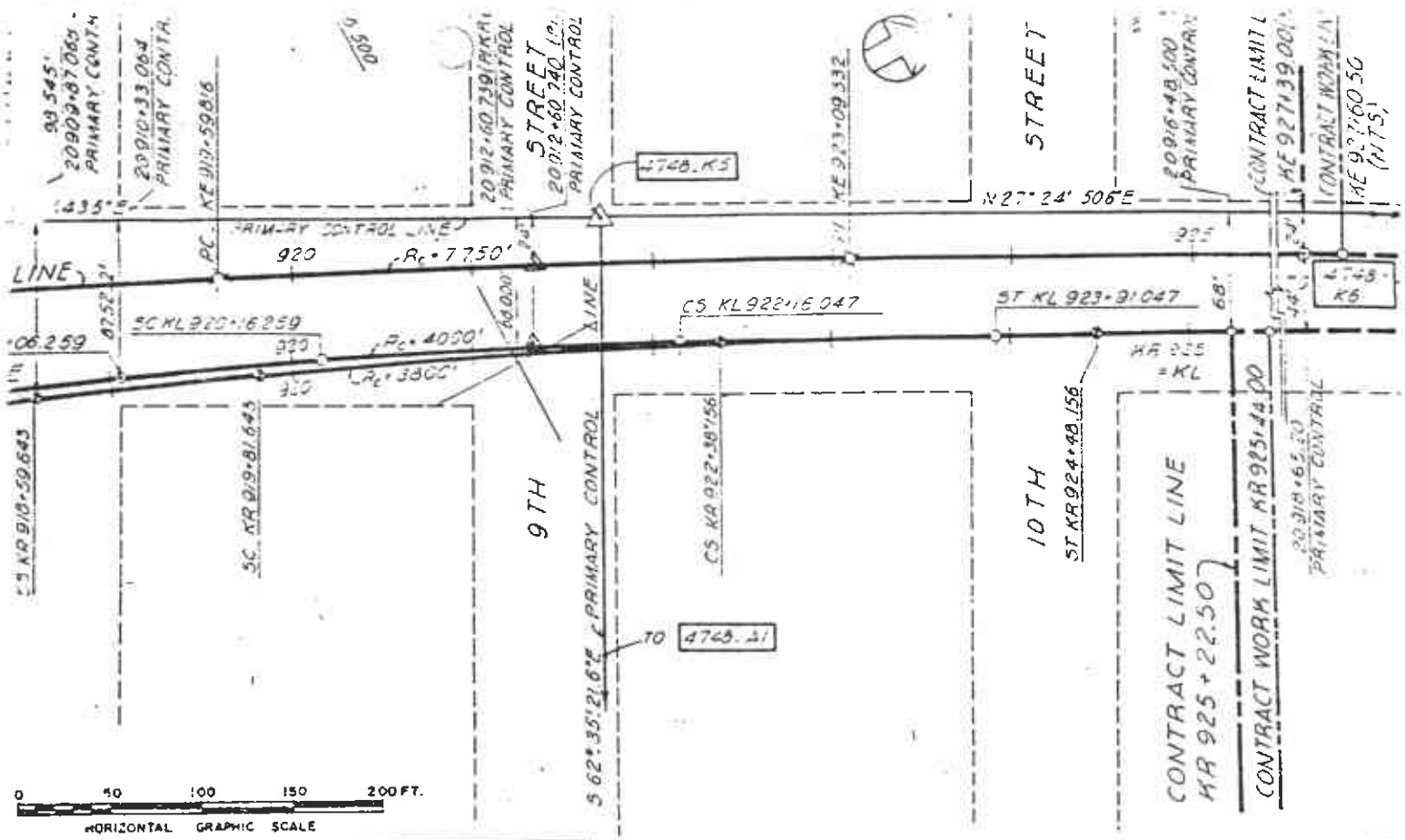
BECHTEL CORPORATION
ENGINEERS
SAN FRANCISCO

PARSONS BRINCKERHOFF-TUDOR-BECHTEL
GENERAL ENGINEERING CONSULTANTS

OAKLAND DOWNTOWN STRUCTURAL ALIGNMENT

KBR, KE, KBL, KR AND KL LINES
FROM KBR 914+50 TO KBR 915+75

SCALE 1" = 20'-0"
CONTRACT - PACKAGE
1K0061-K00
SHEET NO. - OF - PLATE NO.
SE13 - 0 | 88



POINT LOCATION	COORDINATES N	COORDINATES E	CURVE DATA
			T_{KL} = 828.755 T_{SP} = 174.788 L_{SP} = 0.000
919+53.316	478 374.560 478 533.189	1487 861.109 1487 954.508	Δ = 2° 35' 023" D_c = 2° 35' 023" R_c = 7 750.000 L_c = 349.516
923+09.332	478 688.349	1488 034.383	0.000 L_{ST} = 174.788 T_{ST} = 350.2:2

BENCH MARKS

POINT	ELEV	DESCRIPTION & LOCATION
36	20.281	Top Disk SFBARTD Monument Intersection Broadway & 5th St
36A	25.902	Top Pin in Std OCM Intersection Franklin St & 6th St
36B	33.501	Top Pin in Std OCM Intersection Franklin St & 8th St
81	33.351	Top Disk SFBARTD Monument Intersection Webster St & 8th St
86C	38.247	Top Pin in Std OCM Intersection Franklin St & 10th St

— PRIMARY CONTROL LINE —

POINT LOCATION		STATION	COORDINATES N	COORDINATES E	DISTANCE IN FEET	BEARING
4748-K4	5TH-BDWY	20 901+58.14	477 560.471	1487 435.326	562.393	N 26° 17' 28.9"E
4748-K4A	BDWY 7TH	20907+20.53	478 064.604	1487 684.497	576.796	N 27° 24' 43.6"E
4748-K5	BDWY 9TH	20 318+27.33	478 576.718	1487 950.047	402.683	N 27° 24' 50.6"E
4748-K6	BDWY 14TH	20 927+00.00	479 821.869	1488 595.661		
4748-K5	BDWY 9TH	20 348+53.36	478 576.718	1487 950.047	1131.481	S 62° 35' 21.6"E
4748-A1	HAR 9TH	20 960+45.44	478 028.201	1489 007.761		

SHEET NO	TITLE
CT 14	KE Line Plan & Profile
CT 16	KL Line Plan & Profile
CT 15	KA Line Plan & Profile
GP 9	General Civil Notes

REFERENCE DRAWINGS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BECHTEL CORPORATION
ENGINEERS
SAN FRANCISCO

PARSONS BRINCKERHOFF-TUDOR-BECHTEL
GENERAL ENGINEERING CONSULTANTS

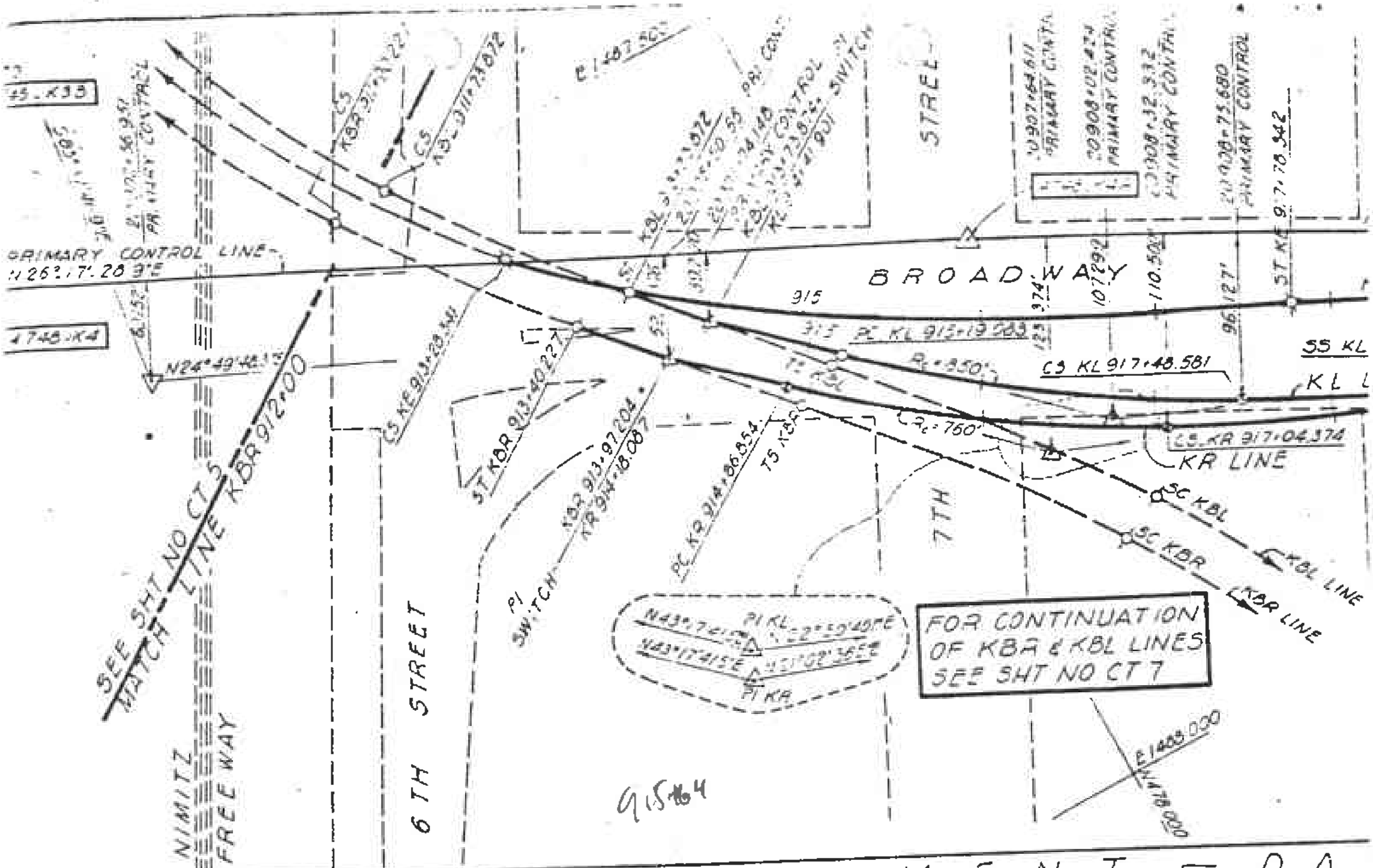
OAKLAND DOWNTOWN ALIGNMENT DATA

KE913+28.341 TO KE925+61.000

SCALE 1" = 50'

CONTRACT - PACKAGE
IKO061 - KOC

SHEET NO. - REV. - PAGE
CT6-0 | 19



ALIGNMENT — DA

KR LINE

POINT	STATION	COORDINATES N	COORDINATES E	CURVE DATA
PI SW	KBR 913+97.204 KR 914+18.087	477885.643	1487662.270	TL = 68.768 Ts1 = 152.949 Ls = 0.000
PC PI CS	KR 914+86.354 KR KR 917+04.374	477935.694 478047.016 478113.060	1487709.426 1487814.313 1487834.062	Δ = 22° 15' 05.0" Δc = 16° 23' 54.9" Rc = 760.000 Lc = 217.519
				K2 = 77.607 P2 = 1.321 Y2 = 5.283 X2 = 155.107 θs2 = 5° 51' 10.1" Ls2 = 155.269 Ts2 = 223.838 TL2 = 275.370
SS	KR 918+59.643	478255.926	1487894.688	TL1 = 223.836 Ts1 = 275.370 Ls1 = 122.000 θs1 = 0° 55' 11.1" X1 = 121.997 Y1 = 0.653 P1 = 0.163 K1 = 60.999
SC PI CS	KR 919+81.643 KR KR 922+38.156	478369.552 478512.931 478604.031	1487939.103 1487993.567 1488042.996	Δ = 6° 22' 14.1" Δc = 3° 52' 03.6 Rc = 3800.000 Lc = 256.513
				K2 = 104.997 P2 = 0.484 Y2 = 1.934 X2 = 209.984 θs2 = 1° 34' 59.4 Ls2 = 210.000 Ts2 = 313.612 TL2 = 211.388
ST	KR 924+48.56	478791.325	1488137.959	

KL LINE

POINT	STATION	COORDINATES N	COORDINATES E	CURVE DATA
PI SW	KBL 913+73.674 KL 914+41.901	477915.851	1487655.270	TL = 77.187 Ts1 = 159.313 Ls1 = 0.000
PC PI CS	KL 915+19.088 KL KL 917+48.581	477972.031 478037.984 478158.158	1487706.202 1487817.451 1487841.260	Δ = 20° 47' 01.5" Δc = 15° 28' 09.9" Rc = 850.000 Lc = 229.494
				K2 = 78.316 P2 = 1.218 Y2 = 4.872 X2 = 157.542 θs2 = 5° 18' 51.4" Ls2 = 157.678 Ts2 = 231.486 TL2 = 228.511
SS	KL 919+06.259	478301.832	1487906.078	TL1 = 231.486 Ts1 = 228.511 Ls1 = 110.000 θs1 = 0° 47' 16.1" X1 = 109.998 Y1 = 0.504 P1 = 0.126 K1 = 55.000
SC PI CS	KL 920+16.259 KL KL 922+16.047	478403.255 478512.931 478584.701	1487948.650 1487993.567 1488032.229	Δ = 4° 54' 10.5" Δc = 2° 51' 42.3" Rc = 4000.000 Lc = 199.787
				K2 = 87.499 P2 = 0.319 Y2 = 1.276 X2 = 174.992 θs2 = 1° 15' 12.0" Ls2 = 175.000 Ts2 = 256.503 TL2 = 268.497
ST	KL 923+91.047	478740.629	1488111.665	

KE LINE

HALF SCALE

DESIGNED BY R. Fitzpatrick
DRAWN BY C. Fuesmacher
CHECKED BY Evers, Jr.
IN CHARGE A.T. Orrenmyer
DATE 27 JUN 67

STATE OF CALIFORNIA
NO. 8397